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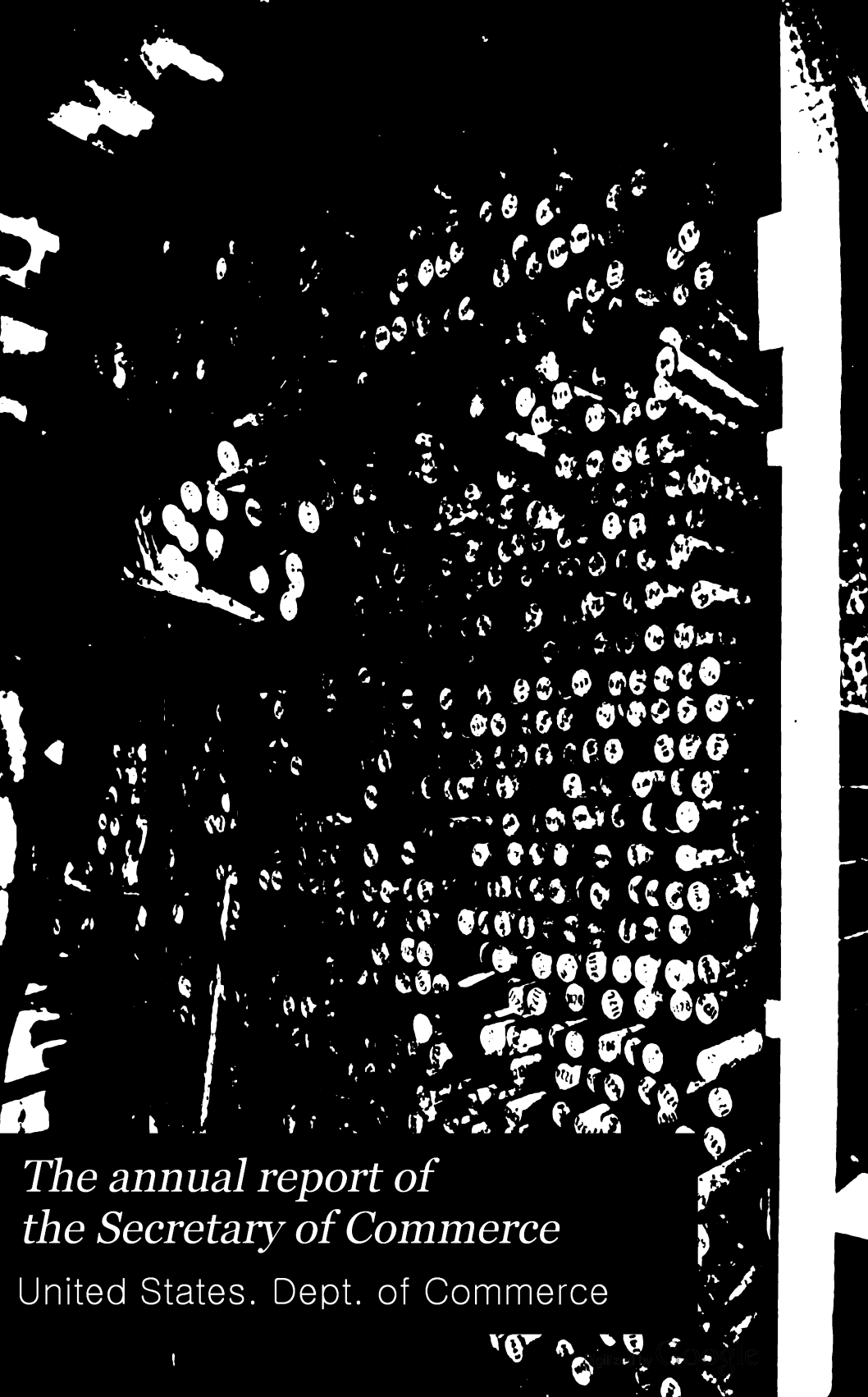
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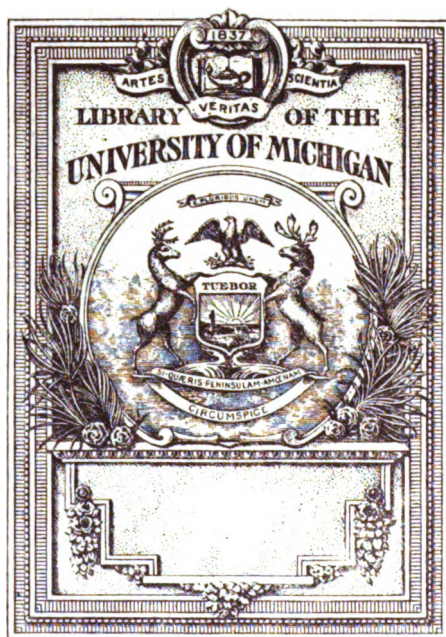
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*The annual report of
the Secretary of Commerce*

United States. Dept. of Commerce



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U.S. Shipping Commission
ANNUAL REPORT

OF THE

SECRETARY OF COMMERCE

1913



**WASHINGTON
GOVERNMENT PRINTING OFFICE
1913**

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U.S. Dept. of Commerce
JAN 20 1914

ANNUAL REPORT

OF THE

SECRETARY OF COMMERCE

1913



WASHINGTON
GOVERNMENT PRINTING OFFICE
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ANNUAL REPORT OF THE SECRETARY OF COMMERCE

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, December 16, 1913.

To the **PRESIDENT**:

I have the honor to submit my first annual report, being the eleventh annual report of so much of the former Department of Commerce and Labor as is now included within the Department of Commerce.

Under the headings in the following pages of the divisions constituting what is technically called the Office of the Secretary and of the bureaus which with them constitute the Department will be found outlined the work of the Department in its various subdivisions.

Under the Disbursing Office will be found a statement of the cost of the Department's operations during the last fiscal year, together with the details of the division of the appropriations for that year between the newly formed Department of Commerce and Department of Labor.

PRESENT ORGANIZATION OF THE DEPARTMENT.

Referring, therefore, to subsequent pages for the details of the service of the Department during the past fiscal year, let me state briefly here what the present organization of the Department is, and, after a few words explanatory of this, proceed to certain outlines of present and future policy looking toward the development of the work of the Department into spheres of enlarged social and public usefulness.

The Department consists of nine bureaus and the Office of the Secretary, the latter being divided into five divisions—Office of the Chief Clerk (including the Division of Supplies), Disbursing Office, Appointment Division, Division of Publications, and Office of the Solicitor. The nine bureaus are respectively those of Foreign and Domestic Commerce, Corporations, Standards, Census, Fisheries, Lighthouses, Coast and Geodetic Survey, Steamboat-Inspection Service, and Navigation.

HOUSING ACCOMMODATIONS.

The Office of the Secretary and five bureaus have been concentrated since October 1 in the Commerce Building, Pennsylvania Avenue and Nineteenth Street NW. The Bureau of Standards, Bureau of the Census, Bureau of Fisheries, and the Coast and Geodetic Survey are in separate buildings in various parts of Washington, all of which, save that occupied by the Census, are owned by the Government. It is hoped to unite during the current year the Bureau of the Census with the rest of the Department by an addition to the Commerce Building. This would save annually a large sum, because the rented building which the Census Bureau now occupies is very costly to maintain. It is also intolerably hot in the summer season, insanitary, and of such construction as to expose to constant risk from fire the invaluable papers stored therein.

The rental paid by the Department for the two privately owned buildings which it occupies, together with that paid for a small stable, amounts to \$70,800 per annum, equal to the interest on \$2,360,000 at 3 per cent. There is a constant element of money loss as well as a loss of efficiency in the separation of the Census Bureau, the Bureau of Fisheries, and the Coast and Geodetic Survey from the rest of the Department. The work of the Bureau of Standards is of such a character as to require that it be placed at a distance from the built-up portions of the city. No such condition affects these other bureaus, two of which are near the Capitol, one on the Mall, and all so placed as to produce the maximum of expense in operation and maintenance with the minimum of efficiency in results. Furthermore, the buildings in which the Coast and Geodetic Survey and the Bureau of Fisheries are located are as ill adapted for their purposes as is that occupied by the Census. Indeed, it would be hard to find two buildings worse suited for the uses to which they are put than are those in which these two important services are housed. Much important work of the Coast and Geodetic Survey is conducted in what was an old stable, and the invaluable plates and records of the Survey are in constant danger of destruction by fire. Two small fires have already occurred and would have resulted in the destruction of the building if the blazes had not been early discovered through a fortunate accident. The building occupied by the Bureau of Fisheries was built as an armory for the militia of the District of Columbia in 1856. In 1878 it was used as a storehouse. In 1882 it was partly used for a fish hatchery. It has long been antiquated and out of date. No private concern that had an eye to economical management would permit the use of these buildings for their respective purposes longer than necessary for obtaining the funds to replace them.

PROPOSED NEW BUILDING.

I strongly recommend that the proposed new Government building for the Department of Commerce be so planned that it shall contain the Bureau of the Census, the Coast and Geodetic Survey, and the administrative portion of the Bureau of Fisheries.

The Bureau of Standards must necessarily remain in its own special laboratories built for its use.

The Bureau of Fisheries should be provided with a modern aquarium, suited alike for the education of the public and the carrying on of the scientific work of the Bureau. This should be housed in a separate building, located as near as practicable to the proposed new building for the Department.

Land has already been purchased by the Government for a building of its own for the Department of Commerce and it would in my judgment be easy to revise the plans for the space intended at the time the plans were made for the bureaus since diverted into the Department of Labor so that it may receive, as above stated, the Census, the Fisheries, and the Coast and Geodetic Survey. In this connection I venture on behalf of the Department and as a business man to protest against the policy of paying rent to private parties for buildings intended for the public service, especially when this requires the work of a great department to be split up into numerous separate parts at a greatly enhanced cost for maintenance and operation.

The Department of Commerce occupies the Commerce Building under a five-year lease, but it would take substantially that time to complete the new structure and it would in my judgment be wise fiscal policy to proceed as promptly as possible with the latter. The site now occupied by the Coast and Geodetic Survey, of which a portion is occupied also by the United States Public Health Service, is a valuable corner immediately adjoining the Capitol, admirably suited for a building to be used in connection with the legislative branch but quite unfit for the home of a part of an executive department most of which is placed at the far end of the city.

EXPENDITURES, PERSONNEL, AND EQUIPMENT.

The cost of maintaining the Department of Commerce for the fiscal year ended June 30, 1913, reckoning only those bureaus of the former Department of Commerce and Labor which are now the Department of Commerce, was \$11,275,977.24. On June 30, 1913, there were turned in to the surplus fund in the Treasury unused balances of the appropriations for the Department of Commerce and Labor amounting to \$618,970.01. The total force employed at the close of the fiscal year (excluding all employees for bureaus now in

the Department of Labor), of which details appear under the Appointment Division, was 17,674 persons. The work of the Department requires the use of the following vessels: Coast and Geodetic Survey, 11; Bureau of Navigation, 1; Bureau of Lighthouses (exclusive of light vessels), 44, and Bureau of Fisheries, 8, a total of 64. This is exclusive of four vessels loaned to the Coast and Geodetic Survey by the Philippine Government. Its services cover the lighting and surveying of the Atlantic, Pacific, and Gulf coasts of the continental United States, the shores of Alaska, Porto Rico, and Hawaii, the lighting of the Great Lakes with their connecting rivers, and the survey of the shores of the Philippine Islands.

The Bureau of Fisheries maintains 34 main and 92 auxiliary fish hatcheries and culture stations, and exercises supervision over the salmon fisheries of Alaska and over the seal herd on the Pribilof Islands, in the Bering Sea.

The Bureau of Standards has laboratories in Washington and Pittsburgh.

The Coast and Geodetic Survey maintains magnetic observatories at Cheltenham, Md.; Tucson, Ariz.; Vieques, P. R.; Sitka, Alaska, and Honolulu, Hawaii, and takes tidal observations at regular stations in Maine, New York, New Jersey, Pennsylvania, Maryland, Florida, Texas, California, Washington, and Alaska.

The Bureau of Foreign and Domestic Commerce has opened, or is preparing to open, offices in New York, Chicago, New Orleans, and San Francisco.

The above survey is both brief and partial, but it gives an idea of the extent of the work of the Department. It may be added that the commercial agents under the Bureau of Foreign and Domestic Commerce travel abroad through all lands, and that the same Bureau receives and publishes the commercial reports of our consuls in all countries, while the agents of the Census Bureau cover all parts of the United States.

OUTLINE OF PRESENT AND FUTURE POLICY.

NECESSITY FOR INCREASED APPROPRIATIONS.

The appropriations for the current fiscal year (ending June 30, 1914) provide for the use of the Department the sum of \$11,485,027.07. The estimates for 1915, including \$484,000 for printing and binding but excluding \$785,000 not directly estimated for public works for the Lighthouse Service, total \$15,800,270, an increase of \$4,315,242.93 over the appropriations for 1914.

The largest single item in the increased funds requested is the necessary provision for the quinquennial census of manufactures which is by law required to be taken for the year 1914. The sum required for this work is \$566,400. Another considerable item is

the request on the behalf of the Coast and Geodetic Survey for three new vessels for Alaska and three small vessels for wire-drag work and resurveys on the Atlantic coast. Attention has been sharply concentrated upon the dangers of the Alaskan coast by the disasters to the Lighthouse vessel *Armeria* and to the *Curacao* and the *State of California*. The last vessel struck an uncharted pinnacle rock in Gambier Bay on August 17, 1913, and sank immediately with the loss of 31 lives. Following these and other accidents the maritime interests of the Northwest have earnestly urged that the coast of Alaska be not only protected by lights and buoys but that the dangers of those shores be carefully surveyed and charted by modern methods. It is obvious that this must be done before Alaska can reach her true prosperity, for we can never approach that territory direct from our own shores except by water, and her maritime commerce must always be a large portion of her total trade. Furthermore, the enlightened humanity of this great nation forbids our accepting such great risks as that involved in the loss of passenger steamers longer than is necessary to bring the funds and the forces of the nation to bear upon them. Three new vessels are therefore needed by the Coast Survey on the shores of Alaska, one of which must replace an old ship not fit for service in exposed localities. The method of surveying known as the "wire drag," had it been used in Gambier Bay, Alaska, a year or more ago, would have saved the loss of the vessel and lives in the case of the steamship *State of California*. Only one such organization is now possible with the funds available. That is at work on the Atlantic coast. Three small vessels are needed to continue this work and it is of urgent importance for human safety that a "wire-drag" party be provided for Alaska.

In like manner and for the same reason it is requisite that the shores of Alaska shall be lighted as promptly as possible and that the necessary aids to navigation on that dangerous coast shall be rapidly multiplied till all dangers are marked. Delay either in the survey or in the protection by lights and buoys of these shores is so risky and unwise a course that this Department can not be responsible for it. Such sums, therefore, as can be wisely spent during the coming fiscal year in these important works form a portion of the increase in the estimates above cited.

There remain five fundamental matters of policy for which funds are asked and to which I specially desire to call your attention and that of the country.

REORGANIZATION OF BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

Under the caption "Bureau of Foreign and Domestic Commerce" will be found a plan for the reorganization of that bureau which

has already met with your approval and which forms a portion of the estimates for the coming year. Our foreign commerce has grown by leaps and bounds until during the fiscal year ended June 30, 1913, it reached the great total of \$4,279,000,000 in value. Of this great sum \$2,466,000,000 were exports and \$1,813,000,000 were imports, showing a trade balance on these transactions in our favor of \$653,000,000. Quite as important as the aggregate, however, are some of the details that go to make up the totals. Our exports of domestic manufactured goods of all kinds amounted to \$1,507,000,000, or 63 per cent of our total domestic exports. Again, it will be noted with special interest that out of this total of sales of manufactures that particular portion which represents the sales of fully finished manufactures was \$778,000,000 in value, or 50 per cent of the total exports of manufactures. To state it differently, our exports of crude food-stuffs and of crude materials of other kinds have fallen to a minor place, and the largest element in the greatest aggregate of foreign sales ever made is that of manufactured goods, and among these manufactured goods the item of fully finished manufactures is the largest. It is also that which has been growing most rapidly.

It certainly can not be said that the Government has done much to foster this great and growing trade. The entire appropriation for the promotion of our foreign commerce has been \$60,000, much less than is annually spent for advertising by many a large retail establishment, nor has the Bureau of Foreign and Domestic Commerce, which is supposed to have had this great trade under its fostering care, been equipped either with men or means or organization adequate for the work.

In the estimates for the coming fiscal year, therefore, a sum has been included which will provide for the reorganization of the Bureau into such form as will make it the basis for productive effort in developing American industries in every field which is normal to them at home and abroad. It is not suggested that in the plans which have been submitted for the approval of Congress there is aught that is original. They simply follow in general the organization which our commercial and industrial competitors have already in active service. They aim to provide a threefold organization abroad containing those elements of permanence and flexibility essential to efficient work, and furnishing the general and the local inquiry essential to any thorough grasp of foreign markets.

Briefly stated, the proposed organization provides for—

Commercial attachés.—These are officers to be located at each of fourteen capitals as hereinafter described, accredited to our embassies there by the Department of State but reporting directly to the Department of Commerce. Each of these officers will be provided with a clerk and allowance will be made for traveling expenses

within the limits of the country to which he is sent. Their purpose will be to study the commerce and industries of the nations where they reside. They will have no other duties. They will collaborate with the consuls, having the advantage of the larger view and of the freedom from other cares.

Consular service.—It is recommended that the consuls shall on purely commercial matters report directly to the Department of Commerce and that they shall cooperate with the commercial attachés in presenting between them a complete and unified knowledge of the commerce and industries of our great competitors. These two forces should normally supplement each other—the attaché has the general field, the consul the particular field. The one collects; the other coordinates. Each supplies with the other that which without him we could not have. Each is at once a corrective and an incentive to the other.

Commercial agents.—It is intended to enlarge this force, which is composed of special investigators trained in their separate lines of study, each pursuing some special theme and for that purpose traveling from country to country wherever information on that subject can be had. A force of from twelve to sixteen men has been employed in this work with excellent results, but obviously that force is quite insufficient, and it is hoped substantially to double it. For this purpose a special appropriation of \$100,000 is asked for the study of commercial conditions in South America, and the former sum of \$60,000 for the whole world is, in addition to the above, increased to \$100,000.

The organization of the Bureau is changed as described herein to provide for the proper direction and control of these forces and funds and to permit following out the duty heretofore imposed by Congress on that Bureau of inquiring into the cost of production at home and abroad, for which purpose a special sum of \$100,000 is also asked.

The direct appropriations for the fiscal year 1914 for the Bureau of Foreign and Domestic Commerce (other than printing and contingent expenses for the Bureau in Washington, which are part of the Department appropriation) amounted to \$224,860, while the estimates for the fiscal year 1915 for the same Bureau are \$592,130, or an increase of \$367,270 in the estimates for 1915 over the appropriations for 1914. Details follow under the heading of the Bureau.

The personnel of the Bureau of Foreign and Domestic Commerce during the fiscal year 1914 is about 119 employees. Under the plan contemplated in the estimates for 1915 it is estimated that 200 persons will be employed, or an increase of 81.

It is my belief that the above marks a turning point in American policy toward the great world of commerce and industry abroad and

that it must be reflected in increased prosperity to our capital and labor at home. It is the counterpoise for our industries of the assistance we are giving to agriculture and means for the workman that which improved methods are already bringing to the farmer.

Since Congress in August, 1912, omitted the appropriation for the collection of figures of internal commerce, the statistics of our domestic commerce have not been gathered. Many protests have been received on this account. In the present state of the law the Bureau of Foreign and Domestic Commerce is without power to secure the reporting of the movements of products in the internal commerce of the country and the machinery in the field for the collection of accurate figures is wanting. The vast movements of products in our coastwise trade are unrecorded. It is earnestly hoped that Congress may clothe the Bureau with power to secure this important information and may permit the use of funds at the disposal of the Bureau for this essential commercial purpose.

INQUIRY INTO EFFICIENCY OF INDUSTRIAL COMBINATIONS.

It is deemed desirable that the Bureau of Corporations shall undertake a study of certain fundamental economic laws on which all our industries are based. There is a growing question in the minds of experienced and thoughtful men as to whether the "trust" form of organization is industrially efficient and whether bigness and bulk are always necessary to production at the lowest cost. It may be conceded that massing of capital and the grouping of great quantities of labor have certain elements of efficiency. They permit research on a large scale. They do away with excessive expense in the maintaining of separate offices and numerous sales organizations. They provide means for the purchase and use of apparatus that can only be employed where production is large. All these things and others like them are unquestionably true and account for much that has been done in promoting the great industrial combinations that are so largely discussed among us. But it is doubtful, at best, whether these favorable elements are all the factors that exist and whether there does not come a point of maximum efficiency at minimum cost beyond which an increase of product means an increase of cost per unit of that product. It is significant that some of the great trusts have ceased to exist; that others pay but moderate dividends, if any, on their securities, and that side by side with the most mighty and supposedly the most efficient of them have grown up independent organizations quite as successful and perhaps earning even more upon their capital than their powerful competitors. Furthermore, it is undoubtedly true that many of the most profitable businesses in the country are those of moderate size and that this is so even in lines where large concerns

exist of apparently less earning capacity. There is no criticism here of "big business" as such but merely the question as to whether "big business" has not its very marked limitations and whether there are not cases where bigness is rather less desirable than efficiency.

It is not necessary to recite the factors which are believed by many to limit economical production in the overgrown enterprise, particularly if its overgrowth be gained by the aggregation of what were unrelated parts. The purpose of the Bureau of Corporations is to study patiently into the historical facts, financial facts, economic facts, facts of human welfare and human productiveness, facts concerning equipment, handling, storing, selling, management, and the like, in order that we may know whether these bulky things that we have so much feared are in an economic sense real giants in strength or whether they are but images with feet of clay. It is of the utmost importance that the laws which govern these things should be made known, for without knowledge of those laws legislation may be vain. It is a common truth that economic laws are stronger than statute laws. There can be no objection, therefore, on the part of anyone, whatever his views of industry, toward a study which shall determine the truth, which truth, if it be indeed the truth, must itself determine in the final analysis the course which the legislature and the executive may wisely take concerning these matters.

For the purpose of this inquiry and for that of studying into the economic laws governing the control of retail prices on the part of manufacturers a considerable sum is asked. The total of the appropriations for the Bureau of Corporations for the fiscal year 1914 was \$253,300. The estimates for the fiscal year 1915 amount to \$685,000, or an increase of \$431,700 in the estimates for 1915 over appropriations for 1914.

The personnel of the Bureau of Corporations for the fiscal year 1914 will average 120 employees, while the estimated personnel for the fiscal year 1915 will be 343, or an increase of 223 employees.

STUDY OF ECONOMIC LAWS GOVERNING THE FIXING OF RETAIL PRICES.

It is important that we should know the truth about the fixing of retail prices and as to whether giving the privilege of so fixing the prices to a manufacturer tends toward monopoly or does not so tend. Men who are sincere and well informed do not think alike on this problem, but whatever their views it will be agreed that no thorough study has ever been made of the subject in this country. Nations abroad are said to favor by law that which we forbid. The law with us is for the time fixed by the decision of the Supreme Court that the

fixing of retail prices on the part of manufacturers is unlawful. If, however, new legislation should in the future be required, it is important that the truth be known lest injustice be done, not so much to the manufacturer as to the consumer. Some men, well informed, argue that the fixing of retail prices under conditions where competition in manufacture exists tends to promote competition. Others say that the refusal to permit the fixing of retail prices tends to monopoly because in the cut-throat competition certain to follow obviously the stronger competitor will survive and may eventually have the business in his own hands, for the law forbids the making of agreements to maintain prices, and under these circumstances the weakest must go to the wall. Such being the views expressed by thoughtful men on a matter in which every consumer is interested because he must needs buy such articles, it is important that the subject should receive thoughtful study, and this the Bureau of Corporations purposes to give to it.

GATHERING OF UNDERLYING FACTS CONCERNING PUBLIC-SERVICE CORPORATIONS.

The Bureau of Standards has begun in a moderate way, and rather through the requests of others than of its own initiative, an inquiry into certain elements underlying the work of our public-service corporations. Another item of increase in the estimates for the coming year is that of \$100,000 in order that the Bureau may carry this work out systematically. It is important that every city and State shall have at its command as accurate and thorough information concerning the facts which underlie its public utilities as is possessed by the companies that operate those utilities. It is quite as important that the public-service companies should themselves know that the municipalities and States are as well informed on these matters as they are themselves. Such information comes to the public-service companies normally out of the operation of their plants, but such information is not always available now to the public authorities that must regulate the public utilities. These facts are of many kinds—electrical, chemical, physical, etc. The Bureau of Standards has the equipment and the organization and the authority to undertake the study. It lacks the funds, and Congress is requested to provide them. What the Bureau has already done in this direction has saved much in litigation, a great deal of passion, large sums of money, and a great deal of time. Its statements, being known to be unbiased and made without thought of profit, are and will be accepted by all parties in interest to the promotion of peace and to the benefit of every man who lights an electric lamp or rides on a street car.

INQUIRY INTO COST OF PRODUCTION OF CLOTHING.

It remains to state but one further point of important policy that the Department desires to carry out. It wishes to supplement the inquiry now drawing to a close into the cost of production in the pottery industry by undertaking an inquiry into the cost of production of clothing of all kinds and of different materials, including hosiery, knit goods, and their fellows. It is recalled that not only is this a matter which affects every man and woman in the country but that it is a subject which has been approached several times but which has never received thoughtful study as a whole. The late Tariff Board inquired into the cost of cotton and woolen and worsted cloth and to some extent into the costs of making knit goods and hosiery. It did not, however, pursue its inquiries fully into the cost of making all clothing of various kinds. Different States and municipalities have given study to the important question of wages and labor in the clothing industries and to the working conditions in them. No one to my knowledge has ever correlated the work of the various public and private organizations—national, State, and municipal—and has added to them an inquiry into the fundamental elements of cost in these industries. Such a study should have important social results. It should develop the question as to whether the sweatshop is economically efficient or whether by a properly organized and more scientific method of manufacture it would not be eliminated by the natural operation of economic law.

The inquiry is not one that can be hurried. It has already been begun with a portion of the funds recently appropriated by Congress. It will be continued if the appropriation of \$100,000 for this and similar work included in our estimates is made by Congress.

INSUFFICIENT EQUIPMENT OF THE DEPARTMENT.

I regret to find the physical condition of the equipment of the Department in some respects very poor. For example, the 44 light-house tenders are, with one exception, without wireless telegraph apparatus. Most of them are seagoing vessels, constantly patrolling our coast, and the nature of their duties makes them peculiarly familiar with its dangers. Loss of life and property may at any time occur because there are no means of summoning these efficient vessels to the help of the distressed.

The salmon agents of the Bureau of Fisheries, whose duty it is to inspect the numerous canneries along the Alaskan coast, are without means of transportation in a territory where there are often no regular transportation lines. They are therefore forced into the absurd

position of depending upon the canneries, which they must inspect, for the means of travel to make such inspections. This, coupled with the fact that four men can hardly cover well some 25,000 miles of coast, is a condition that should not be allowed to continue. Request has therefore been made of Congress for vessels to provide proper means of transport for the inspectors and an increased force of them.

The lighthouses along our coast are not connected by a telephone system. Telephones were installed during the Spanish war, but they have been allowed to fall into disrepair and are out of use. I know of one wreck near a lighthouse where for lack of a telephone lives were lost, for neither the lighthouse nor the life-saving station close at hand had any means of communication. I do not believe the generous American people desire their lighthouse vessels to be without wireless apparatus, their lighthouses to be without telephones, or their fisheries inspectors to be at the mercy for transportation of the people whom they are supposed to watch. Recommendations have been made to Congress covering all these matters.

OFFICE OF THE SECRETARY.

OFFICE OF THE CHIEF CLERK.

TRANSFERS TO THE DEPARTMENT OF LABOR.

The act approved March 4, 1913, creating a Department of Labor, transferred from the Department of Commerce and Labor the Commissioner General of Immigration, the commissioners of immigration, the Bureau of Immigration and Naturalization, the Division of Information, the Division of Naturalization, the Immigration Service, the Bureau of Labor, and the Children's Bureau, and all that pertained thereto, and changed the name of this Department to the Department of Commerce. The total number of positions in the aforementioned services at the date of transfer was 1,798, and the value of the property in the bureaus in Washington transferred amounted to \$96,298.20.

In addition to the foregoing, 29 positions, with salaries aggregating \$24,740 per annum, and furniture and other equipment valued at \$9,489.84, were transferred from the Office of the Secretary of Commerce to the Office of the Secretary of Labor, in accordance with the provisions of the acts approved March 4 and May 1, 1913. The 29 positions referred to above do not include one position of clerk at \$1,600 per annum transferred by the appropriation act of March 4, 1913, from the Bureau of Immigration and Naturalization to the Office of the Secretary, effective July 1, 1913, as it was dropped from the Secretary's roll on the same date. This position was included in the total number of positions in the Bureau of Immigration and Naturalization transferred to the Department of Labor under the provisions of the act of March 4, 1913, creating that Department.

The positions transferred were as follows: 2 clerks of class 3 at \$1,600 per annum each, 5 clerks of class 2 at \$1,400 per annum each, 2 clerks of class 1 at \$1,200 per annum each, 2 clerks at \$1,000 per annum each, 1 clerk at \$900 per annum, 1 skilled laborer at \$840 per annum, 2 assistant messengers at \$720 per annum each, 4 laborers at \$660 per annum each, 3 watchmen at \$720 per annum each, 2 messenger boys at \$480 per annum each, and 5 charwomen at \$240 per annum each.

The following is a complete list of all furniture, equipment, etc., transferred from the Office of the Secretary of Commerce to the Office of the Secretary of Labor:

Articles.	Number.	Value.	Articles.	Number.	Value.
Awnings.....	94	\$146.40	Pads.....	14	\$1.73
Base, wood, for hatrack.....	1	1.50	Paste, jar, pint.....	1	.13
Bases, for file cases.....	25	21.41	Pencil-sharpening machines.....	3	8.07
Baskets.....	13	5.16	Penholders.....	4	.09
Bookcase base and top.....	1	4.09	Perforators, paper.....	6	6.01
Boxes, file, Woodruff.....	16	5.28	Platforms.....	8	4.98
Brackets, fan.....	36	72.00	Portables, electric.....	32	42.28
Cabinets, filing and card-index.....	51	912.92	Prismatic lighting equipment.....	1	96.49
Carpet.....	c 397½	549.66	Racks:		
Cases, storage and miscellaneous.....	73	479.39	Book, desk.....	1	5.00
Cashier, Brandt automatic.....	1	147.00	Hat, bent-wood.....	9	31.50
Chairs.....	23	158.06	Pen.....	7	.42
Checks, door.....	11	30.05	Stamp.....	12	3.64
Clip, board.....	1	.22	Rugs.....	4	96.55
Costumer.....	1	1.25	Rulers, assorted.....	7	1.09
Covers, rubber, typewriter.....	2	No charge.	Safe, burglar-proof.....	1	462.50
Cups, sponge.....	15	.69	Screens.....	16	37.00
Cuspidor, nickeled.....	1	2.06	Shades:		
Daters.....	24	64.24	Holophane.....	247	126.28
Desks.....	20	508.07	Window.....	196	187.75
Doors.....	8	109.04	Shears.....	6	1.89
Erasers, steel.....	7	1.75	Shelving, pine.....	c 200	16.00
Extinguishers, fire.....	4	46.40	Shovel, scoop.....	1	1.10
Fans, electric.....	58	611.60	Stamps.....	76	7.36
Fire hoe.....	1	1.60	Stands:		
Fixtures, ceiling.....	20	36.50	Calendar.....	3	.18
Glass, plate, desk top.....	1	3.64	Ink.....	18	1.84
Grill, iron.....	1	117.85	Multigraph.....	1	30.00
Holders.....	5	10.42	Typewriter.....	7	27.10
Horses, "Grace" and "Nelle".....	2	400.00	Umbrella.....	3	4.80
Keys, typewriter.....	b 1	2.45	Stools, assorted.....	5	16.02
Ladders, step.....	2	4.00	Switchboard, telegraph.....	1	40.00
Linoleum.....	c 1,896½	2,286.38	Tables.....	2	58.00
Locker, wood.....	1	5.00	Trays.....	21	10.80
Mats.....	11	66.65	Truck, 4-wheel.....	1	16.20
Mirror, walnut frame.....	1	8.00	Tumblers.....	4	.12
Multigraph, Gammeter, No. 4, with type.....	1	300.00	Typewriters.....	8	736.00
Numbering machines.....	5	62.90	Wardrobes.....	2	60.00
Openers, envelope.....	3	.18	Weights, paper.....	12	1.14
			Towels.....	680	117.20
			Total.....		9,489.84

c Yards.

b Set.

c Feet.

The Department has also transferred to the Department of Labor \$39,600 from its contingent fund and \$84,000 from its printing allotment for the fiscal year ending June 30, 1914.

REMOVAL OF DEPARTMENT.

During the latter part of September and the first few days in October, 1913, the offices of the Secretary of Commerce and the Bureaus of Foreign and Domestic Commerce, Corporations, Lighthouses, Navigation, and Steamboat-Inspection Service, and the Office of the Solicitor were moved to the building erected under contract for the Department at the corner of Nineteenth Street and Pennsylvania Avenue NW. The building is an eleven-story and basement, modern, fireproof structure, is arranged to meet the needs of the offices and bureaus occupying it, and contains approximately 129,000 square feet of available floor space. The task of moving the Department's bureaus and offices into their present quarters was performed with smoothness and expedition and without interruption to the public business. The moving was begun on September 19 and was completed on October 5, 11 days earlier than the time estimated by the contractor who did the moving. There was no delay in the telephone service, as weeks before the moving began each bureau furnished a statement of the telephone equipment required and the telephone company was directed to pull the requisite number of wires through the conduits. Accordingly, a day before a bureau moved into the building the telephone company was instructed to install the equipment already ordered.

In addition to the bureaus above mentioned, the Bureau of Labor Statistics of the Department of Labor is temporarily located in the new building, having been assigned about 10,700 square feet of floor space.

At the present time all the bureaus that were formerly occupying rented buildings, with the exception of the Bureau of the Census, are accommodated in this building. The latter Bureau still occupies its old quarters at the corner of First and B Streets NW. The owners of the Commerce Building have, however, submitted an informal proposition to the Department to build an addition to the present Commerce Building to contain about 50,000 square feet of available floor space, in order that the Bureau of the Census may be housed in the same building with the Office of the Secretary and the other bureaus of the Department except those that are now in Government-owned buildings. The enlarged building would afford sufficient floor space to accommodate the Bureau of the Census, and the additional rent would be paid from the appropriation for the rental of quarters for that Bureau. The removal of the Bureau of the Census into the same building in which the Office of the Secretary is located would result not only in increased efficiency but in a considerable saving in the cost of maintenance. At the present time

it requires about \$36,000 a year to maintain the Census building, whereas the estimated cost of maintaining the proposed addition to the Commerce Building would not exceed \$8,000.

CONSOLIDATION OF STOCK AND SHIPPING SECTION.

On moving into its present quarters, the Department consolidated the stock and shipping sections of the Divisions of Publications and Supplies into one section, with ample quarters on the first floor of the building. This combined section has been temporarily placed in charge of a clerk who is under the immediate supervision of the Chief Clerk of the Department. The consolidation has resulted in economy of floor space and will make more efficient the handling and filling of requisitions both from the bureaus in Washington and the various outside services of the Department.

DISBURSING OFFICE.

The itemized statement of the disbursements from the contingent fund of the Department of Commerce and the appropriation for "General expenses, Bureau of Standards," for the fiscal year ended June 30, 1913, required to be submitted to Congress by section 193 of the Revised Statutes of the United States, the itemized statement of expenditures under all appropriations for propagation of food fishes during the fiscal year ended June 30, 1913, required by the act of Congress approved March 3, 1887 (24 Stat., 523), and a statement showing travel on official business by officers and employees (other than the special agents, inspectors, and employees in the discharge of their regular duties, who are required to travel constantly) from Washington to points outside of the District of Columbia during the fiscal year ended June 30, 1913, as required by the act of Congress approved May 22, 1908 (35 Stat., 244), will be transmitted to Congress in the usual form.

APPROPRIATIONS.

The following table shows the total amounts of all annual appropriations for the various bureaus and services of the Department of Commerce and Labor for the fiscal year ended June 30, 1913, of all appropriations made for public works in the various services of the Department which, under the law, may be disbursed without regard to any particular year, and of all permanent, indefinite, and deficiency appropriations. The table shows also appropriations for bureaus transferred to the Department of Labor under the act approved March 4, 1913.

Object of appropriation.	Annual appropriations, 1913.	Appropriations for public works.	Special appropriations and claims.	Total.
Office of Secretary of Commerce and Labor.....	• \$280,830.00		\$9,771.95	\$290,601.95
Bureau of Corporations.....	254,200.00			254,200.00
Bureau of Foreign and Domestic Commerce.....	176,242.41			176,242.41
Bureau of Standards.....	490,782.66		85,346.48	566,129.14
Bureau of Navigation.....	163,060.00		• 3,041.21	166,101.21
Steamboat-Inspection Service.....	534,740.00		• 2.99	534,742.99
Bureau of the Census.....	1,548,742.58		8,186.00	1,556,928.58
Coast and Geodetic Survey.....	1,016,020.00	\$20,000.00	47.74	1,036,067.74
Bureau of Fisheries.....	941,790.00		403,129.91	1,344,919.91
Bureau of Lighthouses.....	5,037,410.00	526,693.00	6,320.68	5,570,423.68
Allotment for printing and binding.....	• 400,000.00			400,000.00
Total.....	10,833,817.65	546,693.00	515,346.96	11,896,357.61
<i>Amounts of appropriations made for Department of Commerce and Labor for bureaus transferred to Department of Labor, in accordance with act approved Mar. 4, 1913.</i>				
Bureau of Labor.....	280,373.67			280,373.67
Bureau of Immigration and Naturalization.....	2,863,864.45	276,000.00	2,375.11	3,142,239.56
Children's Bureau.....	21,936.45			21,936.45
Total.....	3,166,174.57	276,000.00	2,375.11	3,444,549.68
Grand total.....	13,999,992.22	822,693.00	518,222.07	15,340,907.29

• Includes \$15,241.43, transferred to Department of Labor.

• Permanent indefinite appropriations.

• Includes \$35,047.40 transferred to Department of Labor.

DISBURSEMENTS.

Disbursements by the Disbursing Clerk, Department of Commerce, during the fiscal year ended June 30, 1913, arranged according to items of appropriation, are shown in the table below. This table shows separately the disbursements during the fiscal year on account of bureaus now in the Department of Commerce and bureaus transferred to the Department of Labor, effective March 4, 1913, under the act of Congress approved March 4, 1913.

BUREAUS NOW IN THE DEPARTMENT OF COMMERCE.

OFFICE OF THE SECRETARY.

Salaries, Office of Secretary of Commerce and Labor, 1912.....	\$7,533.85
Salaries, Office of Secretary of Commerce and Labor, 1913.....	155,695.50
Contingent expenses, Department of Commerce and Labor, 1911.....	214.39
Contingent expenses, Department of Commerce and Labor, 1912.....	19,475.34
Contingent expenses, Department of Commerce and Labor, 1913.....	86,015.62
Rent, Department of Commerce and Labor, 1912.....	3,965.11
Rent, Department of Commerce and Labor, 1913.....	44,890.16
Total.....	317,789.97

BUREAU OF CORPORATIONS.

Salaries, Bureau of Corporations, 1912-----	\$3,316.78
Salaries, Bureau of Corporations, 1913-----	72,215.88
Salaries and expenses, special attorneys, examiners, etc., Bureau of Corporations, 1912-----	8,078.41
Salaries and expenses, special attorneys, examiners, etc., Bureau of Corporations, 1913-----	130,243.62
Total-----	<u>213,854.69</u>

BUREAU OF MANUFACTURES.

Salaries, Bureau of Manufactures, 1912-----	1,525.05
Salaries, Bureau of Manufactures, 1913-----	5,199.39
Collating tariffs of foreign countries, 1912-----	390.68
Collating tariffs of foreign countries, 1913-----	9,535.85
Salaries and expenses, commercial agents, Department of Commerce and Labor, 1912-----	1,252.39
Salaries and expenses, commercial agents, Department of Commerce and Labor, 1913-----	1,515.63
Total-----	<u>10,408.99</u>

BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

Salaries, Bureau of Foreign and Domestic Commerce, 1913-----	84,780.48
Promoting commerce, Department of Commerce and Labor, 1913-----	8,262.76
Total-----	<u>93,043.24</u>

BUREAU OF STATISTICS.

Salaries, Bureau of Statistics, 1912-----	3,068.88
Salaries, Bureau of Statistics, 1913-----	10,598.67
Collecting statistics relating to commerce, 1912-----	154.17
Collecting statistics relating to commerce, 1913-----	534.44
Total-----	<u>14,356.16</u>

BUREAU OF STANDARDS.

Salaries, Bureau of Standards, 1912-----	9,500.97
Salaries, Bureau of Standards, 1913-----	217,006.63
Laboratory, Bureau of Standards-----	101,569.72
Testing machine, Bureau of Standards-----	26,694.30
Equipment, Bureau of Standards, 1911-----	3,505.00
Equipment, Bureau of Standards, 1912-----	6,050.44
Equipment, Bureau of Standards, 1913-----	28,925.00
General expenses, Bureau of Standards, 1911-----	4.65
General expenses, Bureau of Standards, 1912-----	1,870.42
General expenses, Bureau of Standards, 1913-----	19,429.67
Testing structural materials of the United States-----	8,850.00
Testing machine at Pittsburgh, Pa., Bureau of Standards-----	2,925.43

Improvement and care of grounds, Bureau of Standards, 1912-----	\$318. 41
Improvement and care of grounds, Bureau of Standards, 1913-----	2, 585. 72
Investigating effects of electric currents, Bureau of Standards, 1912-----	1, 524. 42
Investigating effects of electric currents, Bureau of Standards, 1913-----	9, 245. 73
Testing machines, Bureau of Standards, 1912-----	2, 867. 05
Testing machines, Bureau of Standards, 1913-----	25, 688. 37
Testing structural materials, Bureau of Standards, 1912-----	8, 802. 10
Testing structural materials, Bureau of Standards, 1913-----	69, 799. 74
Refrigeration constants, Bureau of Standards, 1913-----	9, 516. 44
Current meter testing tank, Bureau of Standards, 1913-----	1, 270. 00
Electrical laboratory equipment, Bureau of Standards, 1913-14--	2, 160. 73
Additional land, Bureau of Standards-----	68, 034. 00
Total-----	<u>627, 644. 94</u>

BUREAU OF NAVIGATION.

Salaries, Bureau of Navigation, 1912-----	1, 386. 71
Salaries, Bureau of Navigation, 1913-----	31, 504. 82
Salaries, Shipping Service, 1912-----	2, 578. 87
Salaries, Shipping Service, 1913-----	27, 968. 63
Clerk hire, Shipping Service, 1912-----	2, 899. 35
Clerk hire, Shipping Service, 1913-----	29, 017. 47
Contingent expenses, Shipping Service, 1912-----	2, 498. 07
Contingent expenses, Shipping Service, 1913-----	6, 861. 87
Instruments for measuring vessels and counting passengers, 1912--	622. 53
Instruments for measuring vessels and counting passengers, 1913--	497. 37
Enforcement of navigation laws, 1912-----	7, 655. 23
Enforcement of navigation laws, 1913-----	9, 240. 18
Enforcement of wireless communication laws, 1912-----	796. 50
Enforcement of wireless communication laws, 1913-----	26, 701. 30
Total-----	<u>150, 228. 90</u>

STEAMBOAT-INSPECTION SERVICE.

Salaries, Office of Supervising Inspector General, Steamboat- Inspection Service, 1912-----	610. 03
Salaries, Office of Supervising Inspector General, Steamboat- Inspection Service, 1913-----	13, 960. 53
Salaries, Steamboat-Inspection Service, 1912-----	28, 695. 20
Salaries, Steamboat-Inspection Service, 1913-----	316, 947. 99
Clerk hire, Steamboat-Inspection Service, 1912-----	7, 070. 60
Clerk hire, Steamboat-Inspection Service, 1913-----	74, 835. 79
Contingent expenses, Steamboat-Inspection Service-----	. 20
Contingent expenses, Steamboat-Inspection Service, 1912-----	14, 227. 64
Contingent expenses, Steamboat-Inspection Service, 1913-----	69, 256. 76
Total-----	<u>525, 604. 74</u>

BUREAU OF FISHERIES.

Salaries, Bureau of Fisheries, 1912.....	\$31,471.69
Salaries, Bureau of Fisheries, 1913.....	337,236.06
Miscellaneous expenses, Bureau of Fisheries, 1911.....	91.01
Miscellaneous expenses, Bureau of Fisheries, 1912.....	55,125.15
Miscellaneous expenses, Bureau of Fisheries, 1913.....	364,275.77
Protecting seal and salmon fisheries of Alaska, 1911-12.....	8,648.19
Protecting seal and salmon fisheries of Alaska, 1913.....	67,301.45
Biological station, Mississippi River Valley.....	29,068.19
Marine biological station, Florida.....	59.85
Marine biological station, North Carolina.....	1,791.06
Steamer <i>Fish Hawk</i> , repairs.....	8,068.15
Payment to Great Britain and Japan.....	400,000.00
Protecting the sponge fisheries, 1912.....	115.00
Protecting the sponge fisheries, 1913.....	75.55
Philippine fisheries report.....	2,303.94
Steam vessel for Alaska.....	13,000.00
Fish hatcheries:	
Kentucky.....	7,493.39
Puget Sound, Wash.....	7,479.06
South Carolina.....	6,376.87
Upper Mississippi River Valley.....	9,298.16
Wyoming.....	185.29
Total.....	<u>1,349,518.83</u>

BUREAU OF THE CENSUS.

/ Salaries, Bureau of Census, 1913.....	545,534.06
Collecting statistics, Bureau of Census, 1913.....	267,770.27
Cotton statistics, Bureau of Census, 1913.....	31,439.14
Rent, Bureau of Census, 1913.....	17,500.00
Tabulating machines, Bureau of Census, 1913.....	23,138.38
Temporary clerks, Bureau of Census, 1913.....	108,107.99
Expenses of the Thirteenth Census, 1910-12.....	7,086.55
Expenses of the Thirteenth Census, 1913.....	13,896.99
Tobacco statistics, Bureau of Census, 1913.....	11,812.78
Total.....	<u>1,026,236.18</u>

BUREAU OF LIGHTHOUSES.

Salaries, Bureau of Lighthouses, 1912.....	2,792.97
Salaries, Bureau of Lighthouses, 1913.....	61,338.72
Salaries, lighthouse vessels, 1912.....	50,229.19
Salaries, lighthouse vessels, 1913.....	400,562.06
Salaries, Lighthouse Service, 1912.....	18,275.31
Salaries, Lighthouse Service, 1913.....	197,844.95
General expenses, Lighthouse Service, 1912.....	395,748.95
General expenses, Lighthouse Service, 1913.....	858,418.04
Salaries, keepers of lighthouses, 1911.....	131.00
Salaries, keepers of lighthouses, 1912.....	45,479.47
Salaries, keepers of lighthouses, 1913.....	399,259.45

Supplies of lighthouses, 1911	\$1,056.64
Repairs, etc., of lighthouses, 1911	11,685.88
Expenses of buoyage, 1911	1,040.28
Expenses of light vessels, 1911	6,313.61
Maintenance of lighthouse tenders, 1911	73.14
Repairs of light vessels, 1911	185.22
Expenses of fog signals, 1911	3,883.00
Lighting of rivers, 1911	966.42
Aids to navigation, Alaska	6,212.06
Ambrose Channel buoys, N. Y.	50.00
Point Judith lighted buoy, R. I.	1,200.00
Edgemoor lighthouse depot, Del.	14,600.22
Staten Island lighthouse depot, N. Y.	20,756.88
Light keepers' dwellings	4,948.13
Bogue Sound Range Lights, N. C.	123.00
Cape Fear River Lights, N. C.	17,024.67
Detroit River Lights, Mich.	24,070.00
Eagle Point Range Lights, N. J.	292.13
Point Judith Breakwater Lights, R. I.	1,517.80
St. Marys River Range Lights, Mich.	1.50
Superior Pierhead Range Lights, Wis.	18,181.26
Tenders:	
First lighthouse district	489.24
Engineer, third lighthouse district	6,921.58
Engineer, sixth lighthouse district	1,125.92
Inspector, eighth lighthouse district	316.00
Fifteenth lighthouse district	219.50
Light vessels:	
Frying Pan Shoals, N. C.	682.84
Milwaukee, Wis.	17,587.70
Point Abino, Lake Erie	382.31
Relief, ninth and eleventh lighthouse districts	12,561.46
Light stations:	
Brandywine Shoal, Del.	67.58
Buffalo Breakwater North End, N. Y.	15,045.61
Kauai Island, Hawaii	6,976.90
Lincoln Rock, Alaska	10.06
Lloyd Harbor, N. Y.	279.28
Miah Maull Shoal, Delaware Bay	20,231.23
Monhegan Island, Me.	305.62
Negro Point, N. Y.	1,600.04
North Point, N. Y.	7,514.08
Point Loma, Cal.	101.00
Punta Gorda, Cal.	273.04
San Pedro Breakwater, Cal.	20,064.45
Thimble Shoal, Va.	6,787.63
White Shoal, Mich.	1,164.27
Storehouses for oil	1,398.37
Light vessels for general service	792.14
Battery Point fog signal, Wash.	14,140.80
Oil houses for light stations	555.04
Total	2,701,908.58

BUREAUS NOW IN THE DEPARTMENT OF LABOR.

BUREAU OF LABOR.

Salaries, Bureau of Labor, 1912.....	\$4, 235. 61
Salaries, Bureau of Labor, 1913.....	67, 185. 81
Miscellaneous expenses, Bureau of Labor, 1910.....	1, 000. 00
Miscellaneous expenses, Bureau of Labor, 1912.....	5, 346. 79
Miscellaneous expenses, Bureau of Labor, 1913.....	40, 648. 72
Library, Bureau of Labor, 1912.....	82. 88
Library, Bureau of Labor, 1913.....	499. 78
Medical examination of injured employees, 1912.....	13. 00
Medical examination of injured employees, 1913.....	194. 00
Total	119, 206. 59

CHILDREN'S BUREAU.

Salaries, Children's Bureau, 1913.....	9, 877. 88
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BUREAU OF IMMIGRATION AND NATURALIZATION.

Salaries, Bureau of Immigration and Naturalization, 1912.....	5, 818. 29
Salaries, Bureau of Immigration and Naturalization, 1913.....	91, 448. 79
Immigrant stations:	
Boston, Mass.....	538. 02
Charleston, S. C.....	34, 172. 99
Ellis Island, N. Y.....	25, 068. 96
Galveston, Tex.....	8, 230. 47
New Orleans, La.....	109, 413. 03
Philadelphia, Pa.....	72, 926. 98
San Francisco, Cal.....	12, 827. 06
Expenses of regulating immigration, 1910-11.....	2, 674. 85
Expenses of regulating immigration, 1911.....	2, 278. 09
Expenses of regulating immigration, 1912.....	212, 196. 91
Expenses of regulating immigration, 1913.....	1, 610, 381. 58
Expenses of regulating immigration (special fund).....	149. 98
Miscellaneous expenses, Division of Naturalization, 1911.....	11. 70
Miscellaneous expenses, Division of Naturalization, 1912.....	16, 736. 14
Miscellaneous expenses, Division of Naturalization, 1913.....	118, 329. 24
Payment of fees to Austrian seamen detained at Ellis Island, N. Y.....	520. 00
Refund to Scandinavian-American Line.....	13. 50
Payments to Wm. von Forlenger and A. Graham.....	2, 000. 00
Total	2, 325, 736. 58

RECAPITULATION.

Total disbursements on account of bureaus now in the Department of Commerce.....	\$7, 039, 645. 22
Total disbursements on account of bureaus now in the Department of Labor.....	2, 454, 821. 05
Grand total	9, 494, 466. 27

The following statement shows the expenditures during the fiscal year ended June 30, 1913, on account of all appropriations under the control of the Department, giving the total amounts disbursed by the various disbursing officers of the Department and miscellaneous receipts for the same period:

By the Disbursing Clerk, Department of Commerce and Labor, on account of salaries and expenses of the Office of the Secretary of Commerce and Labor, the Bureaus of Corporations, Foreign and Domestic Commerce, Labor, Navigation, Immigration and Naturalization, Standards, Fisheries, and Lighthouses, the Office of the Supervising Inspector General, Steamboat-Inspection Service, expenses of regulating immigration, salaries and expenses of Steamboat-Inspection Service at large, and public works of the Immigration and Fisheries Services (shown in detail in the foregoing table of disbursements).....	\$9,494,466.27
By the authorized disbursing officers of the Lighthouse Service.....	2,638,306.59
By the special disbursing agent, Coast and Geodetic Survey, on account of salaries and expenses of the Coast and Geodetic Survey.....	1,009,095.36
By the disbursing clerk, Bureau of the Census, on account of salaries and expenses of the Bureau of the Census.....	134,856.90
By the special disbursing agents of the Immigration Service.....	18,329.61
By the commercial agents of the Department investigating trade conditions abroad, as special disbursing agents.....	44,966.60
By special disbursing agents, Bureau of Fisheries.....	22,099.11
By customs officers on account of witnesses' fees in steamboat investigations.....	634.15
By warrants drawn on the Treasurer of the United States to satisfy accounts settled by the Auditor for the State and other Departments, classified as follows:	
Office of the Secretary.....	\$702.13
Bureau of Foreign and Domestic Commerce.....	1,291.28
Bureau of Standards.....	4,923.77
Steamboat-Inspection Service.....	65.50
Bureau of Navigation.....	2,781.36
Bureau of Immigration and Naturalization.....	2,577.36
Bureau of Fisheries.....	9,273.33
Bureau of Lighthouses.....	175,853.82
Bureau of the Census.....	180,086.76
Coast and Geodetic Survey.....	11,305.41
	<hr/> 888,800.67
Total.....	<hr/> 13,751,705.26

MISCELLANEOUS RECEIPTS, FISCAL YEAR 1913.

Coast and Geodetic Survey:	
Sale of Charts, Tide Tables, etc.....	\$15,709.88
Sale of property, outside work.....	1,016.84
Bureau of Standards: Standardizing and testing weights, etc.....	13,439.48

* To Mar. 4, 1913.

Bureau of Immigration and Naturalization:

Head tax	\$2,767,402.00
Exclusive privileges	9,853.16
Naturalization fees	191,361.00
Telephone rentals, etc	1,372.32
Fines and court costs	43,493.85
Bureau of Navigation: Navigation fees	153,223.17
Bureau of Fisheries:	
Sale of sealskins	130,640.57
Sale of fox skins	20,505.17
Proceeds of sale of condemned property, etc., by the Department	46,320.06
	<hr/>
	3,399,343.10
Other receipts:	
Annual yacht tax	109.34
Tonnage tax	1,273,789.43
	<hr/>
Total	4,673,241.87

BALANCES OF APPROPRIATIONS.

The following unexpended balances of appropriations were turned into the surplus fund June 30, 1913, in accordance with the act of June 20, 1874 (18 Stat., 110-111):

Salaries, Office of Secretary of Commerce and Labor, 1911	\$1,228.29
Salaries and expenses, commercial agents, Department of Commerce and Labor, 1911	2,693.65
Rent, Department of Commerce and Labor, 1911	2,524.81
Contingent expenses, Department of Commerce and Labor, 1911	7,171.23
Salaries, Bureau of Corporations, 1911	2,933.88
Salaries and expenses, special attorneys, examiners, etc., Bureau of Corporations, 1911	56,459.19
Salaries, Bureau of Manufactures, 1911	1,292.92
Collating tariffs of foreign countries, 1911	10.51
Salaries, Bureau of Standards, 1911	11,887.73
Equipment, Bureau of Standards (certified claim)	5.49
Equipment, Bureau of Standards, 1910	16.79
Equipment, Bureau of Standards, 1911	89.90
Additional land, Bureau of Standards	16,966.00
Testing structural materials, Bureau of Standards, 1911	191.29
General expenses, Bureau of Standards, 1911	69.10
Investigating effects of electric currents, Bureau of Standards, 1911	140.72
Improvement and care of grounds, Bureau of Standards, 1911	214.43
Weights and measures, Bureau of Standards, 1910 11	918.11
Salaries, keepers of lighthouses, 1911	130,938.61
Salaries, Coast and Geodetic Survey, 1911	5,412.78
Party expenses, Coast and Geodetic Survey, 1910 11	9,805.77

* These figures include receipts of the Bureau of Immigration and Naturalization for the period from July 1, 1912, to Mar. 4, 1913, the date on which it was transferred to the Department of Labor.

Party expenses, Coast and Geodetic Survey, 1911-----	\$9,209.93
General expenses, Coast and Geodetic Survey, 1911-----	453.06
Pay, etc., of officers and men, vessels, Coast Survey, 1911-----	5,275.81
Repairs of vessels, Coast Survey, 1911-----	881.72
Salaries, Bureau of Fisheries, 1911-----	16,580.73
Miscellaneous expenses, Bureau of Fisheries, 1911-----	3,750.82
Salaries, agents at seal fisheries in Alaska, 1911-----	432.50
Supplies for native inhabitants of Alaska, 1911-----	289.16
Salaries, Bureau of Navigation, 1911-----	530.00
Instruments for measuring vessels and counting passengers, 1911-----	300.57
Contingent expenses, Shipping Service, 1911-----	3,582.56
Supplies of lighthouses, 1911-----	13,632.69
Repairs and incidental expenses of lighthouses, 1910-11-----	1,279.31
Repairs and incidental expenses of lighthouses, 1911-----	19,823.44
Expenses of light vessels, 1911-----	29,635.87
Lighting of rivers, 1911-----	12,322.57
Salaries, Bureau of Statistics, 1911-----	865.15
Collecting statistics relating to commerce, 1911-----	6.96
Salaries Office of Supervising Inspector General, Steamboat- Inspection Service, 1911-----	161.11
Salaries, Bureau of Lighthouses, 1911-----	6,137.48
Pay of clerks, Lighthouse Service, 1911-----	25,477.78
Expenses of buoyage, 1911-----	16,845.70
Expenses of fog signals, 1911-----	23,954.81
Eagle Point Range Lights, N. J.-----	4.57
Great Lakes Channel Lights, 1911-----	2,000.00
Greenville Channel Lighted Buoy, N. J.-----	9,000.00
Neebish Channel Lights, St. Marys River, Mich., 1911-----	2,541.84
St. Marys River Range Lights, Mich-----	2,220.25
Southeast Shoal Light Vessel, Lake Erie, 1911-----	4,000.00
St. Joseph lighthouse depot, Mich-----	5,354.03
Staten Island lighthouse depot, N. Y.-----	3,750.12
Cleveland Harbor Breakwater Light Station, Ohio-----	1,561.75
Hinchinbrook Entrance Light Station, Alaska-----	24,689.10
Lloyd Harbor Light Station, N. Y.-----	7,708.81
Lake Borgue Light Station, Miss-----	99.06
Punta Gorda Light Station, Cal-----	635.31
Southwest Light Station, Conn-----	26,528.34
Split Rock Light Station, Lake Superior-----	2,622.54
Maintenance of lighthouse tenders, 1911-----	61,750.04
Repairs to lighthouse tenders, 1911-----	2,289.13
Repairs to light vessels, 1911-----	19,809.69
Total-----	618,970.01

BALANCES OF APPROPRIATIONS TRANSFERRED TO THE DEPARTMENT OF LABOR, IN
ACCORDANCE WITH THE PROVISIONS OF THE ACT APPROVED MARCH 4, 1913,
CREATING THE DEPARTMENT OF LABOR.

Bureau of Labor:

Salaries, Bureau of Labor, 1911-----	\$2,235.28
Salaries, Bureau of Labor, 1912-----	1,822.22
Salaries, Bureau of Labor, 1913-----	35,097.86

Bureau of Labor—Continued.

Miscellaneous expenses, Bureau of Labor, 1910-----	\$1,300.00
Miscellaneous expenses, Bureau of Labor, 1911-----	3.33
Miscellaneous expenses, Bureau of Labor, 1912-----	1,167.17
Miscellaneous expenses, Bureau of Labor, 1913-----	23,488.29
Library, Bureau of Labor, 1911-----	3.81
Library, Bureau of Labor, 1912-----	.52
Library, Bureau of Labor, 1913-----	500.22
Medical examination of injured employees, 1911-----	2,751.00
Medical examination of injured employees, 1912-----	2,826.66
Medical examination of injured employees, 1913-----	2,808.00
Commission on industrial relations, 1913-----	100,000.00
International Congress on social insurance-----	10,000.00
Total-----	<u>184,002.36</u>

Children's Bureau: Salaries, Children's Bureau, 1913-----	<u>12,058.57</u>
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Bureau of Immigration and Naturalization:

Salaries, Bureau of Immigration and Naturalization, 1911--	3,961.29
Salaries, Bureau of Immigration and Naturalization, 1912--	3,861.71
Salaries, Bureau of Immigration and Naturalization, 1913--	47,415.66
Expenses of regulating immigration, 1911-----	12,602.41
Expenses of regulating immigration, 1912-----	56,046.67
Expenses of regulating immigration, 1913-----	1,049,736.64
Expenses of regulating immigration, 1910-11-----	10,363.19
Expenses of regulating immigration, 1909 and prior years--	593.07
Expenses of regulating immigration (special fund)-----	2,408.89
Immigrant stations--	
Boston, Mass-----	310,178.98
Charleston, S. C-----	3,063.49
Ellis Island, N. Y-----	280,116.91
Galveston, Tex-----	11,824.40
New Orleans, La-----	70,894.54
Philadelphia, Pa-----	81,495.68
San Francisco, Cal-----	43,569.91
Special examiners, etc., Division of Naturalization, 1911----	4.21
Additional assistants to clerks of courts in naturalization cases-----	1,496.95
Miscellaneous expenses, Division of Naturalization, 1911----	1,625.42
Miscellaneous expenses, Division of Naturalization, 1912----	3,110.28
Miscellaneous expenses, Division of Naturalization, 1913----	82,059.04
Trust fund, Rosa Goldman-----	500.00
Unclaimed funds, Jai Bel Ota-----	2.27
Refund of fine, Rafael Subira-----	20.00

Total-----	<u>2,077,041.61</u>
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Salaries, Department of Commerce and Labor, 1913-----	3,013.38
Contingent expenses, Department of Commerce and Labor, 1913--	12,228.10

Total-----	<u>15,241.48</u>
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Grand total-----	<u>2,288,344.02</u>
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DISBURSEMENTS MADE BY THE DISBURSING CLERK, DEPARTMENT OF COMMERCE, WHILE ACTING AS SPECIAL DISBURSING AGENT, DEPARTMENT OF LABOR, DURING THE PERIOD FROM MARCH 4, 1913, TO AND INCLUDING MAY 5, 1913.

Bureau of Labor Statistics:

Salaries, Bureau of Labor, 1913-----	\$16,348.88
Miscellaneous expenses, Bureau of Labor, 1911-----	3.33
Miscellaneous expenses, Bureau of Labor, 1912-----	.20
Miscellaneous expenses, Bureau of Labor, 1913-----	9,612.20
Library, Bureau of Labor, 1913-----	233.12
Medical examination of injured employees, 1913-----	117.00
Total-----	<u>26,314.73</u>

Bureau of Immigration:

Salaries, Bureau of Immigration and Naturalization, 1913--	23,100.02
Expenses of regulating immigration, 1911-----	1.56
Expenses of regulating immigration, 1912-----	1,187.20
Expenses of regulating immigration, 1913-----	419,111.81
Immigrant stations—	
Ellis Island, N. Y.-----	1,125.92
Galveston, Tex.-----	3,362.33
New Orleans, La.-----	23,521.88
Philadelphia, Pa.-----	3,519.42
San Francisco, Cal.-----	8,848.62
Total-----	<u>483,778.76</u>

Bureau of Naturalization:

Miscellaneous expenses, Division of Naturalization, 1912----	1.16
Miscellaneous expenses, Division of Naturalization, 1913----	38,793.47
Total-----	<u>38,794.63</u>

Children's Bureau: Salaries, Children's Bureau, 1913----- 4,273.33

Grand total----- 553,161.45

APPOINTMENT DIVISION.

STATISTICS RELATING TO THE PERSONNEL.

The accompanying table shows by bureaus the number of positions in the Department on July 1, 1913, and the increase or decrease in each bureau as compared with August 24, 1912. The latter date is used for the reason that the legislative, executive, and judicial and the sundry civil appropriation acts were not approved until August 23 and 24, respectively. The figures do not include the following employments, appointment to which is not made by the Secretary: Crews on vessels in the Coast and Geodetic Survey, which consisted of 468 employments; employments of persons engaged in rodding, chaining, recording, heliotroping, etc., in field parties of the Survey, of which there were 1,300; temporary employments in the field oper-

ations of the Bureau of Fisheries, of which there were 3,988; mechanics, skilled tradesmen, and laborers employed in the Lighthouse Service under the authority of Schedule A, Subdivision I, section 12, of the civil-service rules, of which there were 3,130. Neither do they include 56 employees of the Treasury Department, employed under various statutes, on work for this Department in connection with the field work of the Bureau of Navigation. The total miscellaneous employments thus enumerated were 8,942.

Bureau.	Statutory.	Nonstatutory.	Total.	In District of Columbia.	Outside District of Columbia.	Increase (+) or decrease (-).
Office of the Secretary.....	a 139	-----	139	139	-----	- 19
Bureau of the Census.....	621	755	1,376	b 657	719	+ 41
Bureau of Corporations.....	68	64	127	b 127	-----	- 2
Bureau of Foreign and Domestic Commerce.....	83	25	108	89	19	+ 13
Bureau of Standards.....	230	82	c 312	272	40	+ 32
Bureau of Fisheries.....	392	6	398	81	317	+ 1
Bureau of Lighthouses.....	57	5,567	5,624	41	d 5,583	+e 508
Coast and Geodetic Survey.....	246	101	347	b 264	83	+ 3
Bureau of Navigation.....	40	55	95	29	66	+ 13
Steamboat-Inspection Service.....	194	68	262	9	253	-----
Total.....	2,065	6,723	f 8,788	1,708	7,080	+g 590

a Includes 13 positions transferred to the Department of Labor, Oct. 16, 1913.

b Employees engaged in work in the field for a part of each year with headquarters in Washington are treated as within the District of Columbia.

c Does not include 5 members of the visiting committee.

d Includes the following positions, appointment to which is not made by the head of the Department: 1,575 laborers in charge of post lights, 1,152 members of crews of vessels, and 448 mechanics, skilled tradesmen, and laborers employed in field construction work in the Lighthouse Service and work of a similar character at the general lighthouse depot at Tompkinsville, N. Y.

e The increase (508) in the Lighthouse Service is due principally to the inclusion of 448 mechanics, skilled tradesmen, and laborers referred to above and not included in the table of positions as of Aug. 24, 1912.

f The total number of positions (8,788) shows a decrease of 1,176 as compared with the total of 9,964 shown as of Aug. 24, 1912, in the last annual report. This decrease is accounted for by the transfer on Mar. 4, 1913, and May 1, 1913, by operation of law, of 1,814 positions to the Department of Labor; 1,798 of these positions being embraced in the Bureau of Labor, Bureau of Immigration and Naturalization, and the Children's Bureau, a net increase of 32 positions in these bureaus over the total of 1,766 positions, reported in the last annual report; 16 positions transferred from the Office of the Secretary and shown in the above table as a part of the decrease (see note g); and the net increase of 590 positions reported in this table.

g Decrease 21, increase 611, leaving a net increase of 590. The largest decrease was in the Office of the Secretary, and was due to the abolishment of 6 positions Sept. 30, 1912, under the provisions of section 8, of the act of Aug. 23, 1912 (work transferred to the Public Printer), and 16 positions transferred May 1, 1913, to the Department of Labor, under the provisions of the act of May 1, 1913. The authorization of 3 new positions effective July 1, 1913, under the provisions of the act of Mar. 4, 1913, makes a net decrease of 19 positions. (One position of clerk at \$1,600 per annum transferred by the appropriation act of Mar. 4, 1913, from the Bureau of Immigration and Naturalization to the Office of the Secretary, effective July 1, 1913, is not included in the foregoing table, as it was dropped from the Secretary's roll on the same date. This position was included in the total number of positions in the Bureau of Immigration and Naturalization transferred to the Department of Labor under the provisions of the act of Mar. 4, 1913, creating that Department.)

PERSONNEL TRANSFERRED TO THE DEPARTMENT OF LABOR.

The following table shows the bureaus and the number of positions in the Department which were transferred by law (acts approved Mar. 4, 1913, and May 1, 1913) to the Department of Labor. The figures do not include emergency employments, appointment to which is not made by the Secretary, such as guards, interpreters, stenographers, etc., in the field service of the Bureau of Immigration and Naturalization, of which there were 1,029 during the period from July 1, 1912, to the close of February 28, 1913.

Bureau.	Statutory.	Nonstatutory.	Total.	In District of Columbia.	Outside District of Columbia.	Increase (+) or decrease (-).
TRANSFERRED MAR. 4, 1913.						
Bureau of Labor	71	20	a 91	b 91	-----	- 2
Bureau of Immigration and Naturalization:						
Bureau proper	43	-----	43	43	-----	-----
Division of Information	12	-----	12	12	-----	-----
Division of Naturalization	45	c 72	117	45	d 72	+ 10
Immigration Service	-----	1,530	e 1,530	f 5	b 1,515	+ 24
Children's Bureau	15	-----	15	b 15	-----	-----
TRANSFERRED MAY 1, 1913.						
Office of the Secretary	16	-----	g 16	16	-----	-----
TRANSFERRED OCT. 16, 1913.						
Office of the Secretary	13	-----	13	13	-----	-----
Total	215	1,612	1,827	240	1,587	+ h 32

a Does not include 1 temporary special agent and 1 temporary clerk (both nonstatutory).

b Employees engaged in work in the field for a part of each year with headquarters in Washington are treated as within the District of Columbia.

c Includes 4 vacancies: 1 temporary clerk (lump-sum appropriation) not included.

d Includes 2 with headquarters in Washington for local field duty.

e Includes 38 vacancies. Does not include 15 temporary employees (job employments), nor 30 positions filled by employees who were connected with other services of the Government and employed occasionally on work for this Department. Does not include 12 employees appointed under the provisions of section 24 of the immigration act of Feb. 20, 1907.

f Detailed to the Bureau in accordance with special provisions of law.

g Does not include 1 position of clerk at \$1,600 per annum. (See note e in preceding table.)

h Net increase over total for the bureaus on Aug. 24, 1912, shown in last annual report.

CHANGES IN THE PERSONNEL.

The table following gives a summary of the changes in the personnel of the Department during the fiscal year ended June 30, 1913, not including the bureaus transferred to the Department of Labor.

APPOINTMENTS.*

Bureau.	Permanent.				Tempo- rary.	Total.
	Competi- tive.	Excepted.	Unclassi- fied.	Total.		
Office of the Secretary	22	2	11	35	12	47
Bureau of the Census	123		89	212	388	600
Bureau of Corporations	21	4	1	26	5	31
Bureau of Foreign and Domestic Com- merce ^b	13	18	4	35	7	42
Bureau of Standards	65		4	69	25	94
Bureau of Fisheries	38	10	16	64	1	65
Bureau of Lighthouses	340	78	1	419	115	534
Coast and Geodetic Survey	51	1		52	54	106
Bureau of Navigation	23	7		30	28	58
Steamboat-Inspection Service	12		1	13	1	14
Total	708	120	127	955	636	1,591

SEPARATIONS AND MISCELLANEOUS CHANGES.

Bureau.	Separations. ^c						Miscellaneous changes. ^d
	From permanent positions.				From temporary positions.	Total.	
	Competitive.	Excepted.	Unclassified.	Total.			
Office of the Secretary.....	55	2	9	66	12	78	52
Bureau of the Census.....	77	2	93	172	386	558	588
Bureau of Corporations.....	19	5	1	25	7	32	53
Bureau of Foreign and Domestic Commerce ^b	21	10	.....	31	5	36	45
Bureau of Standards.....	69	.....	1	70	22	92	149
Bureau of Fisheries.....	33	6	23	62	3	65	59
Bureau of Lighthouses.....	362	38	.....	400	99	499	865
Coast and Geodetic Survey.....	56	.....	2	58	43	101	157
Bureau of Navigation.....	11	7	.....	18	27	45	68
Steamboat-Inspection Service..	13	.....	1	14	1	15	12
Total.....	716	70	130	916	605	1,521	2,048

* Includes appointments under Executive orders, reinstatements, transfers within the Department, transfers to the Department from other departments or independent establishments, and presidential appointments.

^b Includes changes in the Bureau of Manufactures and the Bureau of Statistics before their consolidation into the Bureau of Foreign and Domestic Commerce on Aug. 23, 1912.

^c Includes separations by removals without prejudice or on charges, resignations, deaths, discontinuance of probationary appointees, transfers within the Department or from the Department to other departments or independent establishments.

^d Includes promotions; reductions; changes of appropriation, designation, name, or station; cancellation of appointment certificates, etc.

The following table gives a summary of the changes in the personnel of the bureaus which were transferred to the Department of Labor in accordance with the provisions of the act of March 4, 1913, for the period from July 1, 1912, to February 28, 1913:

APPOINTMENTS.*

Bureau.	Permanent.				Tempo- rary.	Total.
	Competi- tive.	Excepted.	Unclassi- fied.	Total.		
Bureau of Immigration.....	89	29	27	145	67	212
Division of Naturalization.....	16	.....	.....	16	4	20
Bureau of Labor.....	.....	.....	.....	.....	12	12
Children's Bureau.....	16	1	1	18	1	19
Total.....	121	30	28	179	84	263

SEPARATIONS AND MISCELLANEOUS CHANGES.

Bureau.	Separations. ^b					Miscellane- ous changes. ^c	
	From permanent positions.				From tem- porary po- sitions.		Total.
	Competi- tive.	Excepted.	Unclassi- fied.	Total.			
Bureau of Immigration.....	81	36	21	138	53	191	316
Division of Naturalization..	12	.....	.....	12	4	16	65
Bureau of Labor.....	2	.....	.....	2	13	15	21
Children's Bureau.....	3	.....	.....	3	1	4	.....
Total.....	98	36	21	155	71	226	402

* Includes appointments under Executive orders, reinstatements, transfers within the Department, transfers to the Department from other departments or independent establishments, and presidential appointments.

^b Includes separations by removals without prejudice or on charges, resignations, deaths, discontinuance of probationary appointees, transfers within the Department or from the Department to other departments or independent establishments.

^c Includes promotions; reductions; changes of appropriation, designation, name, or station; cancellation of appointment certificates, etc.

TEMPORARY APPOINTMENTS IN THE BUREAU OF THE CENSUS.

In addition to the regular force provided for the Bureau of the Census in the legislative, executive, and judicial appropriation act approved August 23, 1912, that act authorized the appointment for such time as might be necessary, but not beyond June 30, 1913, of not exceeding 175 temporary clerks from among the employees of the Thirteenth Census force, such clerks to be paid salaries not greater than \$900 per annum or on a piece-price basis. For the payment of the compensation of these clerks the sum of \$120,000 was appropriated. The limitation placed on the number of temporary clerks thus

authorized was removed by a provision in the legislative, executive, and judicial appropriation act approved March 4, 1913, but no additional amount was appropriated. Under this authority the Department increased the number of temporary clerkships to 275. As there were about 3,000 former Thirteenth Census employees who were eligible for appointment to these positions, it was obviously desirable to establish some plan which would properly and economically restrict the selections to a small group of eligibles, and, while not legally necessary, it was also deemed desirable to apportion the appointments as far as practicable among the various States and the District of Columbia according to population. With these ends in view, the following regulations were adopted:

1. Appointments were apportioned among the States and the District of Columbia according to population, preference being given to those persons who were immediately available (in the District of Columbia or within a radius of 20 miles from the center thereof). In the event any State was unable to supply its quota, selections were made from the State which, in the opinion of the Bureau, furnished the most desirable candidates.

2. Further preference was given those having had sufficient experience in operating tabulating, sorting, or punching machines to make them familiar with such work.

3. In general, those having the highest efficiency ratings during their Thirteenth Census employment were given preference subordinate to that given in regulations 1 and 2.

4. Entrance salary was \$720 per annum, without promise of promotion.

5. Leave regulations were the same as for the Thirteenth Census force, namely, annual and sick leave accrued at the rate of 2½ days a month, all sick leave to be supported by a doctor's certificate.

6. Appointments contained a clause limiting service to June 30, 1913, but subject to termination at any time.

PRESIDENTIAL POSITIONS.

The following table shows the presidential positions in the Department on July 1, 1913. Those marked with an asterisk (*) do not require confirmation by the Senate. There was a reduction of 18 presidential positions during the year, caused by the transfer of 10 positions to the Department of Labor and by a change in the manner of making appointment to 8 in the Alaskan Service of the Bureau of Fisheries. These positions are shown in subsequent tables.

Position.	Compensation.	Tenure.	Authority.
Secretary of Commerce.....	\$12,000	Indefinite.....	32 Stat., 825.
* Assistant Secretary of Commerce.....	5,000	do.....	Do.
Director of the Census.....	6,000	do.....	32 Stat., 51.
* Commissioner of Corporations.....	5,000	do.....	32 Stat., 827.
Deputy Commissioner of Corporations.....	3,500	do.....	Do.

Position.	Compensation.	Tenure.	Authority.
Chief of Bureau of Foreign and Domestic Commerce.	\$4,000	Indefinite.....	Act Aug. 23, 1912.
Assistant Chief of Bureau of Foreign and Domestic Commerce.	3,000	....do.....	Do.
Do.....	2,750	....do.....	Do.
Director of the Bureau of Standards.....	6,000	....do.....	31 Stat., 1449.
Commissioner of Fish and Fisheries.....	6,000	....do.....	25 Stat., 1.
Deputy Commissioner of Fisheries.....	3,500	....do.....	32 Stat., 1102.
* Commissioner of Lighthouses.....	5,000	....do.....	36 Stat., 827.
* Deputy Commissioner of Lighthouses.....	4,000	....do.....	Do.
* Chief Constructing Engineer, Bureau of Lighthouses.	4,000	....do.....	Do.
* Superintendent of Naval Construction, Bureau of Lighthouses.	3,000	....do.....	Do.
Superintendent of the Coast and Geodetic Survey	6,000	....do.....	25 Stat., 849.
Commissioner of Navigation.....	4,000	....do.....	23 Stat., 118.
Supervising Inspector General, Steamboat-Inspection Service.	4,000	....do.....	R. S., 4402.
Ten supervising inspectors of steam vessels (with headquarters at San Francisco, Cal.; New York, N. Y.; Norfolk, Va.; St. Louis, Mo.; Boston, Mass.; Louisville, Ky.; Pittsburgh, Pa.; Detroit, Mich.; Cleveland, Ohio; and New Orleans, La.), each.	3,000	....do.....	R. S., 4404.

The following presidential positions were transferred to the Department of Labor, effective March 4, 1913, by the act approved March 4, 1913, creating that Department:

Position.	Compensation.	Tenure.	Authority.
Commissioner of Labor Statistics.....	\$5,000	Term of 4 years unless sooner removed.	25 Stat., 182.
Commissioner General of Immigration.....	5,000	Indefinite.....	28 Stat., 780.
Commissioner of Immigration at the ports of— New York, N. Y.....	6,500	Term of 4 years unless sooner removed and until successor is appointed.	28 Stat., 391.
Baltimore, Md.....	4,000	....do.....	Do.
Boston, Mass.....	4,000	....do.....	Do.
Philadelphia, Pa.....	4,000	....do.....	Do.
San Francisco, Cal.....	4,000	....do.....	Do.
San Juan, P. R.....	3,600	....do.....	Do.
Seattle, Wash.....	4,000	....do.....	Do.
Chief of the Children's Bureau.....	5,000	Indefinite.....	Act Apr. 9, 1912.

The sundry civil appropriation act approved June 23, 1913, provided that appointments to the following-named positions, which had theretofore been made by the President and confirmed by the Senate, be made by the Secretary of Commerce.

Position.	Compensation.	Tenure.	Authority.
Agent, Alaska salmon fisheries.....	\$2,500	Indefinite.....	33 Stat., 478.
Assistant agent, Alaska salmon fisheries.....	2,000	do.....	Do.
Do.....	1,800	do.....	36 Stat., 1429.
Warden, Alaska service.....	1,200	do.....	Do.
Deputy warden, Alaska service (4 positions).....	900	do.....	Do.

* The compensation of these positions was increased from \$600 to \$900 per annum, effective July 1, 1913.

CREATION OF THE BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

The act making appropriation for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June 30, 1913, approved August 23, 1912, consolidated the Bureau of Manufactures and the Bureau of Statistics into a bureau, to be known as the Bureau of Foreign and Domestic Commerce. The positions authorized for the new bureau as compared with those provided for the Bureaus of Manufactures and Statistics for the preceding fiscal year, as well as the increases and decreases in the various classes of positions, are shown in the following table:

Position.	Bureau of Foreign and Domestic Commerce.		Bureau of Manufactures.		Bureau of Statistics.		Increase.		Decrease.	
	No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.
Chief of Bureau.....	1	\$4,000	1	\$4,000	1	\$4,000			1	\$4,000
Assistant Chief of Bureau.....	1	3,000					1	\$3,000		
Do.....	1	2,750					1	2,750		
Do.....			1	2,500					1	2,500
Chief of Division of Consular Reports.....	1	2,500					1	2,500		
Chief of division.....			1	2,100					1	2,100
Do.....					1	2,000			1	2,000
Chief clerk.....	1	2,250			1	2,250				
Stenographer to Chief of Bureau...	1	1,600	1	1,600						
Clerks, class 4.....	7	1,800	2	1,800	5	1,800				
Clerks, class 3.....	5	1,600	2	1,600	5	1,600			2	1,600
Clerk.....	1	1,500			1	1,500				
Clerks, class 2.....	11	1,400	3	1,400	9	1,400			1	1,400
Clerks, class 1.....	14	1,200	4	1,200	11	1,200			1	1,200
Clerks.....	17	1,000	4	1,000	13	1,000				
Do.....	11	900	5	900	6	900				
Messenger.....	1	840			1	840				
Assistant messengers.....	5	720	2	720	1	720	2	720		
Laborers.....	4	660	1	660	1	660	2	660		
Laborer.....	1	480			1	480				
Total.....	83	104,860	27	36,600	57	73,650	7	11,010	8	16,400

* Net decrease of 1.

† Net decrease of \$5,390.

In addition to the reduction of \$5,390 in the appropriation for the statutory force, indicated above, the \$4,000 appropriation for the collection of facts relating to the internal and foreign commerce of the United States, under which one chief of division at \$2,500 per annum and one clerk at \$1,200 per annum had been employed in the Bureau of Statistics, was not provided for after August 23, 1912. Thus the total reduction in expenditures for salaries was \$9,090.

In view of the reduction in the number of positions in the higher classes, it was necessary to make a readjustment of the forces of the two bureaus, which resulted in the appointment of one chief of division as commercial agent, the demotion of one chief of division and 19 clerks, and the transfer of three clerks to the Bureau of the Census.

EFFICIENCY RECORDS.

The first step toward securing efficiency records in the Department was taken in March, 1906, when the Civil Service Commission, by direction of the President, requested each executive department and independent bureau to furnish full lists of all superannuated employees, with information as to their efficiency ratings and how many of them were veterans. These lists, with the ratings, were obtained from the bureaus of this Department and promptly transmitted to the Civil Service Commission. Later in the year the Department decided to obtain the same information in regard to the efficiency of all of its officers and employees below the presidential class, regardless of the superannuation and the military or naval feature involved in the previous investigation. The ratings thus obtained were used to a considerable extent in considering recommendations for promotion. In each of the investigations made in 1906 the efficiency records were based solely upon the judgment and reports of the bureau officers.

A second investigation into the efficiency of the personnel of the Department was conducted in the summer of 1909, and a third during the summer of 1911. The efficiency ratings thus established were consulted whenever recommendations for promotions were received, and if it appeared that employees not having the highest ratings were recommended for advancement the bureau officers were called upon for a statement of the reasons for the action proposed.

By section 4 of the act approved August 23, 1912 (legislative, etc., appropriation act for the fiscal year 1913), Congress has by implication apparently taken out of the hands of the several executive departments the work of maintaining efficiency records for the classified service (at least in the District of Columbia) and placed it under the Civil Service Commission. As a later act, approved March 4, 1913,

provided that the Commission should investigate and report to the President, with its recommendations, with respect to the administrative needs of the service relating to personnel in the several executive departments and independent establishments in the District of Columbia, and report to Congress details of expenditure and of progress of work at the beginning of each regular session, it did not appear entirely feasible or desirable to make a separate investigation into the efficiency of employees of this Department immediately prior to that to be made by the Commission. For present purposes the latest efficiency records, compiled in the summer of 1911, are used as the basis for promotions, care being taken to see that any changed conditions in the personnel caused by the lapse of time are taken into account. It is the aim of the Department to see that in each case the person promoted is, of the class in which he is employed, the one most entitled to advancement.

PROMOTIONS.

It is the policy of the Department to fill vacancies by the promotion of employees from the classes below. The lowest class, if not filled by transfer or reinstatement, is filled by selection from the civil-service registers. It is desirable that this policy be continued, for the reason that it will inspire the working force with the sense that their interests are considered and assure them that by faithful service they will be given fair consideration in connection with such opportunities for advancement as may occur.

During the year the Department's Chief Clerk and Superintendent resigned and, in keeping with the policy outlined, the vacancy was filled by the promotion of one of the division chiefs in the Office of the Secretary, and the resulting vacancies down to the lowest class were similarly filled. A deputy chief of a bureau was appointed as head of the bureau to fill a vacancy, and a local inspector of boilers was appointed as supervising inspector of a district in the Steamboat-Inspection Service, both of the vacancies being in presidential grades.

LAW OF APPORTIONMENT.

In the early part of this year the President's Commission on Economy and Efficiency submitted to the President a special report on the apportionment of appointments in the departments at Washington, as provided for in the following provision of section 2 of the civil-service act of January 16, 1883:

Appointments to the public service * * * in the departments at Washington shall be apportioned among the several States and Territories and the District of Columbia upon the basis of population as ascertained at the last preceding census.

The same section of the act also provides that appointments are to be so apportioned "as nearly as the conditions of good administration will warrant."

The President's Commission in its report objected not so much to the law itself as it did to its interpretation and application by the Civil Service Commission. Among other things it stated:

After an exhaustive study of the records of the Civil Service Commission and of the evidence which was obtained from the departments * * *, the President's Commission has come to the conclusion that the interpretation which has been given to the act by the Civil Service Commission has been such as practically to defeat its primary purpose; that instead of giving to applicants the benefit of competitive examinations, and instead of giving to the service the benefit of rules adopted for "testing the fitness of applicants"; instead of making available to the Government persons who had by the rules established been given a rating of superior merit, every "condition of good administration" has been made subordinate and subservient to demands that can find no explanation except a desire to continue a system which the law was designed to supplant. Practically the only effect of the law as interpreted had been to eliminate from the possibility of appointment to positions in the classified service such persons as had entirely failed to obtain any standing whatever, i. e., to obtain an average above the passing mark.

For many reasons it is doubtless desirable to have employees of the civil branch of the Government represent the various States and sections of the country, but it is more than doubtful whether such a policy is of sufficient importance to wholly outweigh the tests which are now provided to determine the merit and qualifications of applicants for the service. In any event, it has been found to be impossible, notwithstanding the efforts of the Civil Service Commission, to maintain even an approximate equilibrium between the number of appointments to which the States are entitled and those which they actually receive. If the provision of law requiring the apportionment of appointments is to continue in force, the Department concurs in the view expressed by the President's Commission that it should be regarded as being only coordinate with the provisions contained in the same section of the civil-service act which requires that selections shall be made "according to grade from among those graded highest as the results of * * * competitive examinations." Either the repeal of the law requiring the apportionment of appointments or its subordination to that providing for the selection of persons from among those graded highest in open competitive examinations, would result in the vitalization of the whole civil-service system. It certainly is not in the interest of good administration to require an appointing officer to make a selection from a certificate of eligibles with comparatively low ratings, say from 70 to 75, when there are eligibles on the register with ratings from 5 to 10 points higher.

The law of apportionment also applies to all transfers from the nonapportioned to the apportioned service, whether intradepartmental or interdepartmental. In a number of instances the Department has been inconvenienced because the Civil Service Commission has not felt at liberty to authorize transfers from the nonapportioned to the apportioned service on the ground that the persons whose transfers were requested were residents of States or Territories which had received an excessive share of appointments. Under the provisions of clause (c), section 8, of civil-service Rule X, the Commission has authority to waive the apportionment upon the certificate of the appointing officer that the transfer requested is in the interest of good administration, and setting forth in detail the reasons therefor. It is believed that the appointing officer should be the sole judge as to the qualifications of a person whom he desires to transfer to his department, and that a certificate to the effect that the transfer is in the interest of good administration should be accepted as sufficient ground for action.

SUPERANNUATION AND RETIREMENT.

The problem of utilizing the services of aged employees to the best advantage is constantly becoming more difficult of solution. The growing volume of work, the demand for increased efficiency, and the introduction of new methods and ideas require the services of men and women whose minds are active and capable of development. It seems inconsistent that the Government should expend large sums of money in attempting to procure properly equipped eligibles to enter its employ and at the same time retain on its rolls those who have long passed their usefulness. The heads of bureaus are reluctant to discontinue the services of superannuated clerks, for to do so would in most cases deprive the latter of their only source of income. Demotion is but a palliation, and does not fully meet the difficulties of the case. It would therefore seem to be only just to provide in some manner for the retirement of such employees on annuities at least partly commensurate with the rates of pay which they have been receiving. In some cases the reduction of force possible through the greater efficiency of younger men and women would go far to meet the cost of these annuities.

LIGHTHOUSE SERVICE.

The placing of the Lighthouse Service upon a civilian basis has been practically completed. During the fiscal year 1913 civilian inspectors replaced the Navy officers in charge of the ninth, eleventh, twelfth, and nineteenth districts, the only districts which remained in charge of such officers. The thirteenth, fourteenth, and fifteenth districts, which include the Mississippi River and its tributaries, are

all under the supervision of Army engineers, the act of the 27th, 1916, providing for a Bureau of Lighthouses and for other purposes, having authorized the President to assign Army engineers or other civil or military inspectors in those districts for such limited period.

In January 23, 1913, the Department adopted new regulations for the Lighthouse Service, the effect of which was to place all lighthouse matters pertaining to noneducational competitive examinations in this service under the direct supervision of the District Secretaries of the Civil Service Commission.

DIVISION OF PUBLICATIONS.

VOLUME AND COST OF PRINTING.

The regular allotment to the Department for printing and binding for the fiscal year 1913 was \$400,000, which was an increase of \$20,000 over that for the previous year. This increase was justified by the fact that the printing and binding for the Bureau of the Census except that in connection with inquiries of the Thirteenth Decennial Census, which had since 1909 been paid for from appropriations for the Thirteenth Census, would be paid for from the allotment to the Department. Of the \$400,000 allotment made under \$309,996.56 was expended, leaving an unexpended balance of \$90,003.44. Of the total allotment to the Department, \$75,000 was authorized on August 30, 1912, to the several bureaus, offices, and services transferred to the Department of Labor by the act of March 3, 1911, leaving that Department. Of the \$75,000 so authorized, there was expended for those bureaus, offices, and services up to May 1, 1913, \$41,702.50, leaving a balance of \$33,297.50, which amount was transferred to the Department of Labor on May 1, 1913.

In addition to the \$309,996.56 expended from the general allotment for 1913, the Department furnished printing and binding to the Bureau of Immigration for the Radio Service costing \$7,500, for which it was reimbursed from the appropriation "Improvement of wireless communication laws, 1913"; also it furnished work to the Bureau of the Census costing \$5,111.43, of which \$383.49 was reimbursed from the appropriation "Tobacco statistics, Bureau of the Census, 1911," and \$4,727.94 was reimbursed from the appropriation "Tobacco statistics, Bureau of the Census, 1912." These additional expenditures aggregated \$12,611.43 and made a grand total of \$421,607.99 expended by the Department during the year, as compared with a total of \$374,995.64 in 1912.

The increase in expenditures in 1913 over 1912 was \$46,612.35. The total expenditures in 1913, however, include \$13,311.34 for the Bureau of the Census, while the figures for 1912 are exclusive of expenditures for that Bureau, printing and binding for which in 1912 was paid for from appropriations for the Thirteenth Decennial

Census. Deducting expenditures for the Bureau of the Census in 1913 and comparing the remainder (\$368,454.68) with expenditures for all the other bureaus, offices, and services of the Department in 1912 (\$374,995.64) shows that there was a decrease of \$6,540.96 in such expenditures. Carrying the comparison still further and omitting also expenditures in both years for the bureaus, offices, and services transferred to the Department of Labor, there was a decrease of \$8,963.07. The suballotments in 1913 to the several branches of the Department of Labor totaled \$2,422.11 more than their expenditures in 1912.

During the fiscal year 1913 the Department issued on the Public Printer 3,634 requisitions for printing and binding, as compared with 3,466 during the preceding fiscal year, an increase of 168. The number for 1913 includes requisitions covering work ordered only up to and including May 5, 1913, for the bureaus, offices, and services transferred to the Department of Labor.

The following statement shows the amount and cost of each class of work called for by requisitions on the Public Printer during the fiscal year 1913, and affords a comparison with the amount and cost of these classes during the preceding two fiscal years:

Class.	1911		1912		1913 ^a	
	Number.	Cost.	Number.	Cost.	Number.	Cost.
Blank forms.....	12,378,007	\$51,369.94	12,269,911	\$51,112.95	13,102,505	\$44,791.41
Reports, pamphlets, etc.....	5,276,080	269,387.99	6,935,745	288,017.67	7,452,145	295,746.09
Letterheads.....	2,254,000	4,209.92	2,110,000	3,830.71	2,101,500	3,247.41
Envelopes.....	98,250	175.10	46,225	155.19	48,045	173.70
Circulars, decisions, and notices.	370,525	2,986.76	308,450	1,882.05	158,650	820.00
Index cards.....	1,644,500	1,397.56	689,200	692.25	884,900	782.26
Guide cards and folders.....	623,310	2,352.07	595,150	1,826.50	205,900	1,126.57
Memorandum sheets.....	2,506,700	2,665.06	1,156,400	1,252.48	4,699,600	2,340.84
Blank books.....	28,069	30,102.46	19,113	23,064.25	30,818	16,081.81
Miscellaneous books (binding)...	2,858	5,448.64	1,358	2,532.35	3,206	5,003.34
Miscellaneous.....		71.25		628.23		1,563.49
Transferred to Department of Labor on May 9, 1913.....						35,047.40
Total.....		370,167.75		374,995.64		c 406,724.92

^a Figures in these columns are for the several classes of work for the Department of Commerce and Labor from July 1, 1912, to Mar. 4, 1913; for the Department of Commerce from Mar. 5, 1913, to June 30, 1913; and for the Department of Labor from Mar. 5, 1913, to May 5, 1913.

^b Of these, 40,000 were synopsis envelopes for the Customs Service, which in 1912 and 1913 are included in blank forms.

^c Of this sum \$6,728.06 covers printing and binding done for the Bureau of Navigation and the Bureau of the Census for which the Department's allotment was reimbursed.

The table following shows the cost of printing and binding for each of the bureaus, offices, and services of the Department during the fiscal years 1912 and 1913, together with the increase or decrease for each bureau, office, and service and the estimated cost of the work on hand but not completed June 30, 1913.

Bureau, office, or service.	Cost of work delivered.		Increase (+) or decrease (-).		Estimated cost of work not completed June 30, 1913.
	1912	1913	Cost.	Per cent.	
Office of the Secretary.....	\$12,900.75	\$19,408.28	+ \$6,507.53	+ 50.44	\$1,571.71
Appointment Division.....	401.13	396.05	- 5.08	- 1.27	36.18
Disbursing Office.....	756.06	1,133.42	+ 377.36	+ 49.91	164.19
Division of Supplies.....	261.01	363.75	+ 102.74	+ 39.36	3.50
Bureau of Corporations.....	9,299.40	11,524.50	+ 2,225.10	+ 23.93	56.95
Bureau of Foreign and Domestic Commerce.....	\$145,778.58	142,818.07	- 2,960.51	- 2.03	8,586.07
Coast and Geodetic Survey.....	31,267.82	26,526.52	- 4,741.30	- 15.16	4,757.98
Bureau of Fisheries.....	9,740.45	12,897.91	+ 3,157.46	+ 32.42	1,896.86
Bureau of Navigation.....	12,321.44	12,130.37	- 191.07	- 1.55	96.00
Shipping Service.....	2,669.20	2,032.81	- 636.39	- 23.84	322.59
Radio Service.....	88.57	1,102.21	+ 1,013.64	+ 1,144.45	123.59
Office, Supervising Inspector General.....	4,278.54	2,456.71	- 1,821.83	- 42.58	6.31
Steamboat-Inspection Service.....	10,630.73	6,767.34	- 3,863.39	- 36.34	1,316.95
Bureau of Lighthouses.....	18,168.35	20,219.62	+ 2,051.27	+ 11.29	1,407.37
Lighthouse Service.....	9,223.16	6,716.44	- 2,506.72	- 27.18	876.94
Bureau of Standards.....	20,475.67	18,278.49	- 2,197.18	- 10.73	3,187.20
Customs Service.....	12,406.89	6,932.19	- 5,474.70	- 44.13	2,996.90
Bureau of the Census.....	(c)	\$38,270.24	.....	.....	5,252.91
Total, Department of Commerce.....	300,667.75	329,974.92	+ 29,307.17	+ 9.75	32,660.20
Bureaus, offices, and services transferred to Department of Labor.....	74,327.89	\$76,750.00	+ 2,422.11	+ 3.26	.....
Grand total.....	374,995.64	\$406,724.92	+ 31,729.28	+ 8.46	.....

* This amount was expended jointly during 1912 by the Bureau of Manufactures and the Bureau of Statistics, which were consolidated into the Bureau of Foreign and Domestic Commerce on Aug. 23, 1912

† Of this amount \$1,716.58 covers printing done for the Radio Service, and the Department's allotment for printing and binding was reimbursed to that extent.

‡ Printing and binding for the Bureau of the Census was paid for in 1912 from appropriations for the Thirteenth Decennial Census.

§ Of this amount \$5,011.48 covers printing done in connection with publishing statistics of cotton and tobacco, and the Department's allotment for printing and binding was reimbursed to that extent.

¶ Of this amount \$41,702.60 was expended by the Department up to May 5, 1913, and the balance (\$35,047.40) was transferred to the Department of Labor on May 9, 1913.

|| Of this amount \$6,728.06 covers printing done for the Bureau of Navigation and the Bureau of the Census for which the Department's allotment was reimbursed.

DISTRIBUTION OF PRINTED SUPPLIES.

There were received and filled during the past year 8,823 requisitions from the various outside services of the Department calling for 8,330,606 blank forms, against 8,093,849 in 1912, and 298,044 books and pamphlets, compared with 315,203 in 1912. There were also received and filled during the year from offices and bureaus of the Department in Washington 360 and from the outside services 369 requisitions for printed stationery, a total of 729, compared with 720 in the preceding year. The 729 requisitions called for 4,270,000 envelopes, 2,039,000 letterheads, 3,146,000 memorandum sheets, 7,700 stenographers' notebooks, 5,200 blank books, 661,000 index and guide cards, 48,000 vertical folders, and 222,000 blank forms.

The filling of the requisitions for blank books, blank forms, and stationery required the making up and forwarding of 15,609 pack-

ages, boxes, and bags, weighing 317,520 pounds, or 159 tons, against 14,967, weighing 293,652 pounds, or 147 tons, in 1912. The writing and forwarding of 11,500 letters and invoices was also required.

PUBLICATION WORK.

During the fiscal year 1913 the Department issued 901 publications, compared with 887 in the fiscal year 1912, 26 of which, against 31 in 1912, were printed in two or more editions during the year, while 76, compared with 51 in the preceding year, were reprints, without change, of issues of earlier years. The publications issued in 1913 contained a total of 50,560 printed pages, compared with 54,702 in 1912, and there were issued of them for the Department a grand total of 7,522,155 copies, against 7,144,490 in the preceding year, an increase of 377,665 copies.

The publication work of each bureau of the Department for the past two fiscal years is summarized in the following table. The table does not, however, include any publications issued by the Bureau of the Census during the fiscal year 1912 or Thirteenth Census publications issued by that Bureau in 1913, owing to the fact that these publications were not paid for from the allotment to the Department. Publications issued by the Children's, Immigration, Naturalization, and Labor Statistics Bureaus after they became parts of the Department of Labor are also omitted from the figures for 1913.

Bureau.	Publications.		Pages.		Copies printed for Department.		Cost, 1913.
	1912	1913	1912	1913	1912	1913	
Office of the Secretary	36	50	1,706	2,560	213,350	92,860	\$7,393.37
Census Bureau ^a		30		2,247		191,700	48,766.20
Children's Bureau ^b		2		87		10,500	198.93
Coast and Geodetic Survey	35	25	4,958	2,070	67,650	31,500	16,450.74
Corporations Bureau	16	19	3,019	3,954	28,700	33,225	14,553.78
Fisheries Bureau	44	49	3,530	2,516	31,775	44,225	12,494.91
Foreign and Domestic Commerce Bureau ^c	440	428	15,387	16,343	5,789,565	6,264,435	135,270.79
Immigration and Naturalization Bureau	50	27	1,341	839	139,575	92,725	5,169.70
Labor Bureau	38	29	12,375	8,127	153,600	132,000	20,351.75
Lighthouse Bureau	105	105	3,023	3,147	238,375	256,695	22,087.51
Navigation Bureau	9	16	3,051	2,239	15,600	74,600	10,998.50
Standards Bureau	95	108	4,765	5,272	88,150	86,700	12,857.91
Steamboat-Inspection Service	19	13	1,547	1,159	378,150	211,000	6,511.71
Total	887	901	54,702	50,560	7,144,490	7,522,155	\$313,105.80

^a Publications of the Census Bureau paid for in 1912 from appropriations for the Thirteenth Decennial Census.

^b Children's Bureau issued no publications in 1912, not being in existence during that year.

^c Figures for 1912 are those of the Bureau of Manufactures and Bureau of Statistics jointly, these two Bureaus having been consolidated into the Bureau of Foreign and Domestic Commerce by the act of Aug. 23, 1912.

^d Figures relate to publications actually becoming available during the year for distribution, consequently they do not agree with similar figures in a preceding table giving the cost of work done by the Government Printing Office during the fiscal year. Frequently the cost of a publication is charged against allotments for two or more fiscal years.

DISTRIBUTION OF PUBLICATIONS.

The work of addressing, wrapping, mailing, or otherwise dispatching publications for public distribution was transferred from the executive departments to the Government Printing Office (Superintendent of Documents) by section 8 of the act approved August 23, 1912, making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year 1913. The act required also that all machines, equipment, and materials used in such work be turned over to the Public Printer before October 1, 1912. The Department complied with this requirement during the month of September, 1912, and a statement of the number of publications and a list of the machines, equipment, and materials transferred to the Superintendent of Documents, together with a statement of the employments dispensed with, were included in the annual report for last year.

This change in the method of dispatching publications has not relieved the Division of Publications of any of its duties except those in connection with addressing wrappers from such mailing lists as are supplied with stencils and the labor of wrapping the publications. The maintenance of mailing lists and the writing of franks for use in responding to individual requests for publications still devolve on the Division, and the correspondence and record keeping have increased rather than decreased.

It is open to question whether the present system is entirely satisfactory. Experience has not demonstrated that it is economical, nor can it be claimed that prompt and efficient attention to individual requests for particular publications is certain under conditions which now prevail, because of the time necessarily consumed in transmitting franks to the Office of the Superintendent of Documents and the extra handling required. Frequent though unavoidable congestion in the Office of the Superintendent of Documents must necessarily add to the resulting delay. Much extra correspondence and searching of records and files is caused by addressees making complaints of failure to receive publications requested, due in many cases to this delay. As these complaints are often transmitted through the bureaus, it may readily be seen that much extra work is caused to both the bureaus and the Division of Publications by the present method of distribution. When publications were sent direct from the Department, requests were acted on and publications placed in the mails as a rule not later than the day following the receipt by the Department of the requests. This is now rarely possible. Also by reason of the familiarity of the employees of the Division of Publications with the Department's publications there was much less liability of error in

sending the publications out. As a result, the present system is often the cause of embarrassment to the Department, especially in filling telephonic requests from Members of Congress, representatives from foreign Governments, and officials of the departments who desire copies of publications for immediate use. Under a strict construction of the law such requests can be filled only through the Government Printing Office, which is attended with more or less delay, while under the former system they could be complied with in a few minutes.

The Department is convinced that it would be wise to modify the law so far as it applies to the filling of individual requests for publications, and in such cases to allow the publications to be mailed direct from the Department. The printing bills (S. 825 and H. R. 6539) now pending in Congress will, if enacted into law, accomplish the reform desired.

The number of publications of the Department sent out on mailing lists and in response to miscellaneous requests during the fiscal year 1913 was 7,107,199, against 6,484,506 during the preceding year, an increase of 622,693, or 9.6 per cent. The following is a statement of the distribution by months:

July	574, 027	February	535, 435
August	623, 000	March	568, 999
September	594, 625	April	590, 911
October	627, 359	May	577, 876
November	552, 972	June	681, 087
December	594, 835		
January	606, 573	Total	7, 107, 199

TRANSFERS TO THE DEPARTMENT OF LABOR.

In compliance with the act approved May 1, 1913, making appropriations for certain expenses incident to the first session of the Sixty-third Congress, etc., the allotment to the Department for printing and binding for the fiscal year 1914 was prorated among its various offices, bureaus, and services, and \$84,000 of the sum allotted was transferred on June 30, 1913, to the Department of Labor. This sum was based on the following suballotments to the several offices, bureaus, and services transferred to that Department, together with \$875 for the office of the Secretary of Labor:

Bureau of Labor Statistics	\$32, 500
Bureau of Immigration	5, 100
Division of Information	2, 300
Immigration Service	18, 800
Bureau of Naturalization	1, 400
Naturalization Service and Naturalization Examiners	13, 925
Children's Bureau	9, 300
Total	83, 125

The suballotments to the bureaus, offices, and services now constituting the Department of Labor for 1913 totaled \$76,750, of which only \$72,375.24 was expended. The amount allotted to that Department for 1914 is therefore \$7,250, or more than 9 per cent, in excess of the amount allotted to it for 1913, and \$11,624.76, or more than 16 per cent, in excess of its actual expenditures in 1913, whereas the increase in the amount available for the Department of Commerce, over either allotment or expenditures (excepting, of course, the Bureau of the Census, which in 1914 for the first time is to use a considerable part of the allotment to the Department), is less than 4 per cent.

On May 15, 1913, there were transferred to the Department of Labor stocks on hand of 165 different publications, aggregating 107,710 copies, which had previously been issued by bureaus of that Department, and on May 6, 1913, there were transferred to it blank books and blank forms belonging to the Immigration Service, Naturalization Service (clerks of courts), and Naturalization Examiners Service embracing 215 different kinds, aggregating 1,156,372 copies.

SALE OF PUBLICATIONS.

Inquiries from time to time, especially by the Printing Investigation Commission, have brought to light extravagances in public printing and binding, not the least important of which is the waste in the present method of free distribution of public documents. This Department has devoted considerable thought to devising means by which such waste may be checked, and it has developed that there is only one way by which this can be done effectually, and that is by restricting gratuitous distribution, as is done by a number of foreign governments. The Department has made a few experiments in selling its publications, with uniformly satisfactory results. In one case an arrangement was entered into with the Superintendent of Documents to furnish a monthly publication of the Bureau of Foreign and Domestic Commerce to subscribers at the rate of \$1 per year, and this periodical has been distributed on such a basis since May, 1913.

In each of these cases the Department has had the helpful cooperation both of the bureaus affected and of the Superintendent of Documents, and the success which has attended experiments so far has convinced the Department that they should be extended gradually to many other publications now distributed gratuitously. This conviction is based upon two very important considerations—first, the plan tends to check waste and extravagance in public printing by restricting excessive demands from sources which frequently can not be benefited by the publications; and second, and equally important, public appreciation of the work of the Depart-

ment can not in any other way be so well gauged as by the willingness with which publications which it may issue are bought, as the Department thus has the public's estimate of the particular classes of publications which emanate from it, and consequently becomes familiar with the public's appreciation of lines of work which devolve upon it. Thus it is enabled to determine those lines to which it shall give greatest attention in developing its work.

Perhaps the Daily Consular and Trade Reports furnishes the best opportunity for the Department now to apply the subscription idea in selling its publications. The limit of 20,000 copies placed by law on the edition of these reports was reached two years ago, and although the current lists have been carefully culled there are hundreds of requests for them which can not be complied with unless Congress permits the printing of a larger edition. It has been necessary to refuse requests even from Members of Congress for copies intended for parties entitled to them. It is estimated that this publication could be supplied to subscribers for \$3.50, or even \$3, per year. If the recipient were required to pay such a nominal price for it, the limit on the edition would be removed, its distribution would be much more equitable than is possible under the present method, and the Department's printing and binding allotment would profit to the extent of about \$40,000 per annum.

The Superintendent of Documents has ample authority to sell public documents at a price based upon the estimated cost of printing from stereotyped plates. There appears no reason why the Department should not take greater advantage of the authority thus granted to relieve its allotment for printing and binding of some of the heavy charges against it, while the sale plan would permit a wider circulation of some publications than is now permitted by the limitation placed on editions by law.

OFFICE OF THE SOLICITOR.

During the fiscal year ended June 30, 1913, 298 contracts, totaling \$1,157,706, together with 68 contracts of indeterminate amount; 124 leases, amounting to \$201,983; 19 revocable licenses, amounting to \$5,327; insurance policies in the sum of \$200,000; and 1,285 bonds, amounting to \$1,690,637, were examined (approved, disapproved, drafted, redrafted, modified).

The number of legal opinions rendered, formal and informal (memorandum), totaled 336. Compensation claims handled, involving an examination as to law and facts, numbered 1,684.

In addition, 794 miscellaneous matters, embracing everything submitted for the advice or suggestion of the Solicitor, or for the formulation of departmental action, not included in the foregoing items, were handled.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

In the act making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year 1913, approved August 23, 1912, Congress established the Bureau of Foreign and Domestic Commerce by consolidating the former Bureaus of Manufactures and Statistics of this Department.

Except for the addition of certain functions related to the investigation of questions arising under tariff legislation, the duties and activities of the two former bureaus were carried on during the year with little material change. The funds which had formerly been appropriated for the collection of statistics of internal commerce were not provided this year, and this made it necessary to omit these records from the Monthly Summary of Commerce and Finance. Many protests have been made by business houses interested in these statistics, and it is urged that the Bureau be again provided with means to gather and publish them. With the growth of our commerce it becomes daily more necessary to have the current statistics of our trade properly recorded in Government publications, and the extension of this particular service should receive careful consideration.

PUBLICITY WORK.

In the active development of the promotive service of the Bureau through publicity there were issued during the year its periodical bulletins of trade information, which include the Daily Consular and Trade Reports; the semiweekly press letters of statistical information; the Monthly Summary of Commerce and Finance; the monthly Sailing Dates of Steamships; the several quarterly statistical statements, and the annual volumes entitled Commerce and Navigation of the United States, Statistical Abstract, and Commercial Relations of the United States. These publications were very widely distributed and the demand for all except the last named is constantly growing. The mailing list of the Daily Consular and Trade Reports has long since reached the limit of 20,000 copies fixed by the present law, and unfilled applications have accumulated for many months. No reason for restricting the issues of this journal, it is believed, should hold against the very practical value which it possesses in relation to the extension of the export trade of the country. As a current record of commercial conditions in foreign countries it is acknowledged to be indispensable to manufacturers and exporters. The information printed in these reports is collected at very great cost, and it is

obviously unwise to restrict unnecessarily the useful distribution of these facts to the commercial interests.

Effort is made to enhance the promotive effect of the statistical bulletins of the Bureau by analyses given to the trade press at frequent intervals. There is a great opportunity for the development of this branch of the work of the Bureau, both through improvement of methods of collecting the statistics of our commerce and by intensive studies of the use made of the published tables. Many of these tables can no doubt in this way be made more practically helpful to business men.

A large number of special commercial reports and confidential circulars were also issued during the year, and these were widely distributed direct to those firms and individuals known to be most practically interested.

Monographs on the foreign markets for motor vehicles, canned goods, musical instruments, cotton goods, shoes and leather, and many other products were published. A specially important report on Foreign Credits and a Directory of Commercial Organizations in the United States were printed, and many copies of these bulletins were sold by the Superintendent of Documents.

DIVISION OF STATISTICS.

The work of this branch of the Bureau should receive much more attention and support than is now afforded it by Congress and commercial interests. In addition to the bulletins on imports and exports, some method of collecting and publishing facts and statistics concerning the current movements of domestic commerce should be promptly established and vigorously developed if we hope to have at our command the essential facts relating to our commercial growth.

DIVISION OF FOREIGN TARIFFS.

The Division of Foreign Tariffs was largely employed during the year in aiding the Ways and Means Committee of the House of Representatives by providing information in regard to tariff matters both at home and in foreign countries. This necessarily reduced materially the volume of its work of translating and publishing the tariffs of foreign countries.

A large quantity of tariff information was, however, distributed during the year by correspondence, through the pages of the Daily Consular and Trade Reports, and by special bulletins.

FIELD INVESTIGATIONS.

A study of the publications of the Bureau will indicate the service performed by its commercial agents during the past fiscal year. As has been the policy for a number of years, special subjects have

been taken up in turn, and studies in the United States and foreign countries have been made of the cotton-textile industry; of the trade in boots and shoes and leather, machinery and tools, drugs and proprietary medicines, canned goods, coke-oven by-products, and oil-seed products; of commercial organizations and commercial laws abroad; of trade association activities in the United States, and many similar matters.

I am convinced that this branch of the work of the Bureau should be very liberally supported by Congress. This country should be behind no other nation in the employment of expert commercial representatives, as specialists in technical commercial fields, in foreign lands. We can not expect to guard and increase our export commerce if we neglect to develop this important service, which is constantly becoming more essential in the struggle for export trade between the great competing manufacturing nations.

Pottery investigation.—The tariff legislation which occupied the attention of Congress during the year directed special attention to the Bureau as a source of useful information in regard to American manufacturing industries.

A request from the manufacturers of pottery in the United States for an intensive study of their industry resulted in a decision to make a careful survey of that subject, not as in direct relation to the pending tariff legislation but as a definite promotive contribution to the commercial history of the country. Such a study was begun in May and is now in progress. When completed it is hoped that the resultant report will be an authoritative and accurate picture of the conditions in the pottery industry, informing not only to the public and Congress but also even to those actively engaged in that industry. The work has already progressed far enough to make it seem certain that the results of the inquiry will be of great interest and of definite practical value.

The advantage of a nonpartisan and disinterested study of such a subject does not need to be pointed out at this time. Nothing is more certain than that public opinion is fixed as to the desirability of having official records of this character available, both for the promotion of commercial efficiency and for use when legislation affecting an industry is to be considered.

DEVELOPMENT AND EXPANSION OF THE BUREAU.

The matter of reorganizing the Bureau of Foreign and Domestic Commerce is of such far-reaching importance to the industry and labor of our land that it has been made the subject of special study. Our foreign commerce, to which in substance the work of the Bureau is, under present law, confined, has expanded during the past

fiscal year at a rate in excess of \$1,000,000 per day.* The relation of this enormous trade to the prosperity of our people is so obvious as to need no comment.

The Bureau of Foreign and Domestic Commerce, which has this work in charge, has not received the financial support to which the dignity and necessity of its work entitles it. The Chief of that Bureau receives but \$4,000 per annum, while in the same Department the chiefs of other bureaus, no more closely related to our welfare, are paid one-half more. The total appropriation, including printing and contingent allotments, is less than \$364,000, which is trivial in comparison with the duties to be performed and the opportunities to be opened.

Being familiar, in a general way, with the operations of this Bureau before assuming office, I gave the subject of its reorganization careful thought for some weeks after it came under my charge as Secretary of Commerce. I then requested the Chief of the Bureau to prepare a written statement of what, in his judgment, should be done to develop the work under his care. When this was done and statements from other departmental sources on the same subject were prepared, I requested a committee of experienced officers in my own Office to go over these papers and to submit a plan for reorganization based upon the facts thus laid before them and on their own experience. This plan I have myself carefully revised, in consultation with the said committee, and it is presented below.

The proposed organization, consisting of five units, divides the work of the Bureau into four classes, namely, (1) promotion work under the immediate supervision of the Chief, (2) collection of information, (3) distribution of information, and (4) administration. This plan provides for a Chief and two Assistant Chiefs. One of the Assistant Chiefs should be placed in charge of investigations to be made under the law which transfers to the Bureau certain duties formerly under the present Bureau of Labor Statistics of the Department of Labor, and of a section dealing with tariffs and tariff relations; the other should be in charge of that part of the work which relates to the collection and compilation of statistics, the work performed by commercial attachés, commercial agents, and consuls, in so far as the work of the latter relates to the Department of Commerce.

*Imports:		
1913.....	\$1, 813, 008, 234	
1912.....	1, 653, 264, 034	
Increase in imports, 1913 over 1912.....		\$159, 743, 300
Exports:		
1913.....	2, 405, 884, 140	
1912.....	2, 204, 399, 400	
Increase in exports, 1913 over 1912.....		201, 581, 740
Increase in total trade, 1913 over 1912.....		421, 305, 040

DIVISION OF THE WORK.

(1) *Promotion work*.—This work should be such as may be assigned to the Chief of the Bureau by the head of the Department in connection with commercial and trade organizations of all kinds, and such other trade-promotion work for which Congress may hereafter provide.

(2) *Collection of information*.—Under this head should be placed the work having to do with investigations made in connection with the duties transferred to the Bureau by recent law, tariff work, statistical work, and the work of commercial attachés, commercial agents, and consuls. This work should be organized under two Assistant Chiefs, one to be in charge of the investigation and tariff work referred to, the other to be in charge of the other classes of work under this group, viz, statistics, commercial attachés, commercial agents, and consuls.

(3) *Distribution of information*.—The work of distribution of information under the proposed plan should be placed in charge of a division to be called the division of commercial reports, the chief of which should come under the immediate supervision of the Chief of the Bureau. This division should have entire charge of the method of presentation of all information collected by the Bureau; the preparation of monographs on special subjects; the editing, revising, and issuing of publications, and the answering of all inquiries for information pertaining to the work of the Bureau.

(4) *Administration*.—The administration should be under a chief clerk, who should be charged with the detail of handling the general administrative affairs of the Bureau.

PERSONNEL AND DUTIES OF THE VARIOUS ORGANIZATION UNITS.

The duties of the Chief of the Bureau shall be such as are required by law and directed by the head of the Department, and which usually pertain to the administration of a Federal bureau. It shall be his duty to foster and promote American commerce and trade, and to make known the duties and operations of the Bureau of Foreign and Domestic Commerce, along the line of trade promotion, by personal conferences with trade organizations, and trade bodies organized for the purpose of promoting the commerce of the United States both at home and abroad. He is, under the suggested arrangement, provided with a private secretary and 2 clerks, making a total personnel of 4 for his immediate office.

The Assistant Chief in charge of investigations and of the section dealing with tariffs and tariff relations should be a lawyer, versed in economics and statistics. He should have in his immediate office 3 clerks, making a total personnel of 4. Congress has been asked for a lump-sum appropriation of \$100,000 for the fiscal year ending June 30, 1915, for the employment of experts and field agents for the pur-

pose of making the investigations required under the act of August 23, 1912. An appropriation of \$50,000 for this purpose was made in the urgent deficiency bill approved October 22, 1913, for the fiscal year ending June 30, 1914.

The tariff section should be provided with a chief and a clerical force of 8 assistants, ranging in salaries from \$1,000 to \$2,000, making a total personnel for this section of 9.

The other Assistant Chief provided in the organization plan, to be in charge of the statistical division, the force of commercial attachés, commercial agents, and work of the consuls pertaining to the Department of Commerce, should have in his immediate office 3 clerks, making a personnel of 4. He should have under him a chief statistician to be directly in charge of the statistical work of the Bureau. The duties of this division should pertain entirely to the tabulation and compilation of statistics pertaining to our foreign trade. These statistics are furnished the Bureau on specially prepared forms. The duties of the division should be merely those of tabulation and compilation without any duties involving the publication or presentation of facts.

The statistical division should be provided with 44 clerks, with salaries ranging from \$900 to \$2,000 per annum. It is my opinion that the present divisions in the Bureau dealing with statistics, viz, compilation and revision, should be consolidated into one division, thus making the entire personnel of this enlarged statistical division interchangeable for all purposes of compilation and final checking of figures. It is believed that the force thus provided for this division will be ample to take care of the work until such time as import and export statistics are considerably enlarged. It may also care for statistics of domestic trade when this work is authorized.

I am informed that there are about two and one-half times as many employees now engaged upon similar work in Canada as in the United States, and that the volume of foreign trade in the United States is nearly five times greater than that of Canada; but I believe that with a proper reorganization of the statistical division of the Bureau satisfactory results may be obtained, for the present, with the personnel recommended.

The division of commercial reports should be charged with the duty of distributing all information collected and collated by the Bureau. The chief of this division should come immediately under the Chief of the Bureau. All materials collected, collated, and compiled in the various divisions of the Bureau should be forwarded to this division, which, under the supervision of the Chief of the Bureau, should devise the method of presenting the information to the public. The division should determine, subject to the direction of the Chief of the Bureau, whether certain information should be published, the form in which it should be published, etc. In this

division should be prepared such monographs on particular topics as it is decided to issue, all replies to inquiries for information on the Bureau, whether made by Congress, the departments, or private individuals, the editing, revising, and proof reading of all publications, and the preparation of matter for the press. It should be supplied with a force of 21 employees, whose salaries should range from \$900 to \$2,500 per annum, making a total personnel of 22 for this division.

The chief clerk should have supervision over the administration of the clerical force of the Bureau and its distribution. He should be in charge of the property and quarters of the Bureau, records relating to leave of absence, accounting, bookkeeping, etc. He should be provided with 3 clerks, 3 assistant messengers, and 2 laborers, making a total personnel of 9.

The following table shows the proposed organization by organization units, together with the salaries for each position:

Position.	Salary.	Position.	Salary.
Chief of Bureau.....	\$7,500	Chief of Bureau—Continued.	
Private secretary.....	1,800	2. Assistant Chief—Continued.	
1 clerk, class 3.....	1,600	a. Chief statistician—Continued.	
1 clerk, class 2.....	1,400	10 clerks, at \$1,000 each.....	\$10,000
a. Promotion (lump-sum appropriation, \$100,000).		10 clerks, at \$900 each.....	9,000
1. Assistant Chief.....	4,000	(Total for division, 45 employees.)	
Confidential clerk.....	1,600	b. (Commercial attachés, \$150,000 appropriation.)	
2 clerks, class 1.....	2,400	c. (Commercial agents, \$100,000 appropriation.)	
(Lump-sum appropriation, \$100,000.)		d. Consuls (for commercial reports).	
a. Chief of division of tariff and tariff relations.....	3,000	3. Chief of division of commercial reports.....	3,000
1 translator.....	2,000	Assistant chief.....	2,500
1 clerk, class 4.....	1,800	2 clerks, class 4.....	3,600
2 tariff assistants, at \$1,400 each.....	2,800	2 clerks, class 3.....	3,200
1 clerk, translator.....	1,400	3 clerks, class 2.....	4,200
1 clerk, stenographer and typewriter.....	1,400	4 clerks, class 1.....	4,800
1 clerk, translator.....	1,200	4 clerks, \$1,000 each.....	4,000
1 clerk.....	1,000	5 clerks, \$900 each.....	4,500
(Total for division, 9 employees.)		(Total for division, 22 employees.)	
2. Assistant Chief.....	4,000	4. Chief clerk.....	2,250
Confidential clerk.....	1,600	1 clerk, class 4.....	1,800
2 clerks, class 4.....	3,600	2 clerks, class 2.....	2,800
a. Chief statistician.....	3,000	3 assistant messengers, \$720 each.....	2,160
1 clerk.....	1,500	2 laborers, \$660 each.....	1,320
Chief of division.....	2,000	(Total for office, 9 employees.)	
5 clerks, class 4.....	9,000	Total.....	142,130
5 clerks, class 3.....	8,000		
5 clerks, class 2.....	7,000		
7 clerks, class 1.....	8,400		

The following table shows, in parallel columns, the proposed and present organization of the Bureau:

Proposed organization.				Present organization.			
Position.	No.	Salary.	Total.	Position.	No.	Salary.	Total.
Chief of Bureau.....	1		\$7,500	Chief of Bureau.....	1		\$4,000
Assistant Chiefs.....	2	\$4,000	8,000	Assistant Chief.....	1		3,000
				Assistant Chief.....	1		2,750
Chief statistician.....	1		3,000				
Chiefs of division.....	2	3,000	6,000	Chief of division.....	1		2,500
Chief of division.....	1		2,000	Chief of division.....	1		2,500
Assistant chief of division.....	1		2,500	Assistant chief of division.....	1		2,000
Chief clerk.....	1		2,250	Chief clerk.....	1		2,250
Translator.....	1		2,000				
Private secretary.....	1		1,800	Stenographer to Chief of Bureau.....	1		1,600
Confidential clerks.....	2	1,600	3,200				
Clerks of class 4.....	11	1,800	19,800	Clerks of class 4.....	7	\$1,800	12,600
Clerks of class 3.....	8	1,600	12,800	Clerks of class 3.....	5	1,600	8,000
Clerk.....	1		1,500	Clerk.....	1		1,500
Clerks of class 2.....	15	1,400	21,000	Clerks of class 2.....	11	1,400	15,400
				Tariff assistant.....	1		1,440
				Translator.....	1		1,400
				Clerk.....	1		1,400
Clerks of class 1.....	14	1,200	16,800	Clerks of class 1.....	14	1,200	16,800
				Translator.....	1		1,200
Clerks.....	15	1,000	15,000	Clerks.....	17	1,000	17,000
Clerks.....	15	900	13,500	Clerks.....	11	900	9,900
				Messenger.....	1		840
Assistant messengers.....	3	720	2,160	Assistant messengers.....	5	720	3,600
Laborers.....	2	660	1,320	Laborers.....	4	660	2,640
				Laborer.....	1		480
Total.....	97		142,130	Total.....	89		114,800

* The salaries for these positions are paid from the appropriation for collating tariffs of foreign countries.

The comparative table shows an increase in salaries of \$27,330, with an increase of only 8 in the number of positions provided for.

SUGGESTED LEGISLATION FOR NEW WORK.

Commercial attachés.—It is believed that Congress should authorize the employment by the Department of 14 commercial attachés, to be resident in various foreign countries, these attachés to be each supplied with a clerk whose compensation should be \$1,500 per annum. The attachés should be divided into three groups as regards salaries, viz, 3 at \$5,000 per annum, 4 at \$4,500 per annum, and 7 at \$4,000 per annum. The countries to which these attachés should be accredited, and their headquarters, are given in the table on the following page, which also gives the total area of the countries represented, population, and total trade with the United States in 1912.

The attachés should be men of demonstrated commercial ability and experience, speaking the language of the country to which they are accredited or a language current in commercial circles therein. Preference would be given officers of the Consular Service and the Department of Commerce or other branches of the executive service who have unblemished records and who have shown marked ability in commercial promotion.

SUGGESTED ORGANIZATION OF A CORPS OF COMMERCIAL ATTACHÉS SHOWING TERRITORY TO BE COVERED BY EACH ATTACHÉ, SALARY, HEADQUARTERS, AREA, POPULATION, AND TRADE WITH THE UNITED STATES IN THE FISCAL YEAR 1913.

District.	Salary.	Headquarters.	Area.	Population.	Imports into United States.	Exports from United States.
			<i>Sq. miles.</i>	<i>Number.</i>		
United Kingdom.....	\$5,000	London.....	121,316	45,366,000	\$295,564,940	\$597,149,059
Germany, Denmark, and Switzerland (possibly Scandinavia). ^c	5,000	Berlin.....	538,929	79,650,000	234,790,699	371,694,379
France, Belgium, and Netherlands.	5,000	Paris.....	231,673	53,114,000	216,969,971	338,855,525
Austria-Hungary, Greece, Balkan States (possibly Turkey). ^b	4,500	Vienna.....	500,224	76,770,000	33,773,531	29,282,920
Argentina, Paraguay, and Uruguay.	4,500	Buenos Aires....	1,309,090	9,150,000	29,372,714	60,604,846
Japan and Chosen ^c ...	4,500	Tokyo.....	245,641	68,997,000	91,638,373	59,112,741
China ^c	4,500	Peking.....	4,277,170	336,042,000	39,010,800	21,326,834
Peru, Bolivia, and Ecuador.	4,000	Lima.....	1,510,143	8,378,000	12,704,618	10,836,433
Russia ^c	4,000	St. Petersburg..	8,361,708	166,108,000	29,315,217	26,465,214
Brazil.....	4,000	Rio de Janeiro..	3,291,416	21,115,000	120,155,855	42,638,467
Chile.....	4,000	Santiago.....	292,420	3,415,000	27,655,420	16,076,763
Italy and Mediterranean countries. ^f	4,000	Rome.....	1,744,000	92,369,000	109,689,965	111,642,963
British South and Central Africa. ^g	4,000	Johannesburg...	2,233,478	35,961,000	4,334,339	18,852,009
Australia, New Zealand, South Pacific Islands. ^h	4,000	Melbourne.....	3,079,332	5,665,000	15,341,362	52,431,352

^c Includes Germany, Switzerland, Denmark, Norway, and Sweden.

^b Includes Austria-Hungary, Roumania, Bulgaria, Servia, Montenegro, European Turkey, and Greece

^c Does not include, as regards area and population, Sakhalin, but for commerce the figures include the southern part of that island. Formosa is included throughout.

^d Does not include leased territory.

^e European and Asiatic.

^f Includes Italy, Spain, Gibraltar, Malta and Gozo, Asiatic Turkey, Egypt, Tripoli, and Morocco.

^g Includes all British Africa. Central Africa not separately stated.

^h Includes only Australia and New Zealand. Area and population of the Southern Pacific islands can not be separately stated. United States commerce with German, French, and British Oceania, exclusive of Australia and New Zealand: Imports, \$1,191,831; exports, \$1,286,700.

The commercial attachés provided for in the organization plan should be officers of the Department of Commerce, who should, however, through the State Department, be accredited to the various foreign embassies and missions in the same manner as naval and military attachés are now accredited. They should establish headquarters where they will always be represented by a clerk, provided in the plan of organization. Their duties should be to collect information which will prove of value to American manufacturers and business concerns. It is suggested that commercial attachés receive appointments of comparatively long terms, as their value to the Government will depend entirely upon their knowledge, through experience, of local conditions in the countries to which they are accredited. They should be excepted from the requirements of competitive civil-service examinations and should be appointed by the Secretary of Commerce. The law should be so framed that the head of the Department of Commerce, through the bureau, can correspond directly with the commercial attachés, and not be required to use any agencies of the State Department for that purpose.

For this work I have recommended that Congress appropriate a lump sum of \$150,000 for 1915. Of this appropriation, under the above plan, \$82,000 would be for salaries of the commercial attachés and their clerks, while \$68,000 would cover traveling and subsistence expenses, rent of quarters, and all other miscellaneous items in connection with their work, including their transportation from Washington to their stations and return. A draft of the suggested appropriation to cover these items is given below:

COMMERCIAL ATTACHÉS: For commercial attachés to be appointed by the Secretary of Commerce without examination under the civil-service rules, and to be accredited through the State Department, whose duties shall be to investigate and report upon such conditions in the manufacturing industries and trade of foreign countries as may be of interest to the United States, as follows: 3 at \$5,000 each; 4 at \$4,500 each; and 7 at \$4,000 each; and for 1 clerk to each of said commercial attachés to be paid a salary not to exceed \$1,500 each, and for necessary traveling and subsistence expenses, rent, purchase of reports, travel to and from the United States, and all other necessary expenses not included in the foregoing, \$150,000: *Provided*, That the commercial attachés shall serve directly under the Secretary of Commerce and shall report directly to him.

Commercial agents.—The force of commercial agents should also come under the immediate direction of an Assistant Chief, whose duties relative to this force should consist largely of advising them as to the class and kind of information that is desired (supervision of the field work), leaving the entire work incident to methods of presentation and issuing of reports to the division of commercial reports. For the commercial agents it is recommended that an

appropriation of \$100,000 be made, to be worded as given in the following form:

To further promote and develop the foreign and domestic commerce of the United States, to be expended under the direction of the Secretary of Commerce, \$100,000: *Provided*, That the consular officers of the State Department shall report directly to the Secretary of Commerce with reference to commercial matters: *Provided, also*, That not exceeding \$3,000 out of the sum hereby appropriated may be expended for the purchase of documents, manuscripts, plans, specifications, and other publications necessary for the promotion of our commercial interests.

Consuls.—The duty of the Assistant Chief in relation to consuls should be that of preparing all calls for commercial information upon a given subject, the direction of the class of general information to be supplied, leaving all questions of methods of presentation, editing, and elimination to the division of commercial reports. It is recommended that the gathering of purely commercial information and the furnishing of commercial data by consuls be under the general supervision of the Secretary of Commerce, while retaining the appointment and control of the consuls under the Department of State, as at present, and appropriate legislation to effect that purpose is recommended in the estimate of appropriations for commercial agents for this Department.

The direct transmission by consular officers of reports relative to the work they, under the law, are required to perform for the Department of Commerce seems to be a more businesslike and efficient procedure than the practice under current law.

Developing trade in Central and South America.—It is believed that the Bureau should be provided with a special lump-sum appropriation of \$100,000 with which to develop the trade of the United States with Central and South America.

The completion of the Panama Canal will greatly facilitate communication between the United States and the vast territory comprising Central and South America, and a special effort should be made by this country to develop its full share of this trade. The following form is suggested for the appropriation:

To further promote and develop the commerce of the United States with South and Central America, including the employment of experts and special agents in Washington, D. C., and elsewhere, purchase of books of reference, reports, traveling and subsistence expenses of officers and employees, and all other necessary incidental expenses not included in the foregoing, to be expended under the direction of the Secretary of Commerce, \$100,000.

Investigation of costs of production.—In the estimates for the fiscal year 1915 an estimate for an appropriation of \$100,000 is made to enable the Department to execute the provisions of law directing investigations into costs of production and other economic conditions

affecting manufacture and trade. Using the language of the law as now on the statute books for a basis, the appropriation should be in the following form:

For salaries and all other actual necessary expenses, including field investigations at home and abroad, compensation of experts and special agents, to be employed in Washington, D. C., or in the field, without examination under the civil-service rules, rental of quarters in Washington, D. C., and elsewhere, purchase of books of reference and manuscripts, to enable the Bureau of Foreign and Domestic Commerce of the Department of Commerce to ascertain at as early a date as possible, and whenever industrial changes shall make it essential, the cost of producing articles at the time dutiable in the United States, in leading countries where such articles are produced, by fully specified units of production, and under a classification showing the different elements of cost, or approximate cost, of such articles of production, including the wages paid in such industries per day, week, month, or year, or by the piece; and hours employed per day; and the profits of manufacturers and producers of such articles; and the comparative cost of living, and the kind of living; what articles are controlled by trusts or other combinations of capital, business operations, or labor, and what effect said trusts or other combinations of capital, business operations, or labor have on production and prices, \$100,000.

This appropriation will provide a corps of experts and special agents who will make the investigations and reports required.

The following table shows the estimated appropriations which will be required if the recommendations in this report are enacted into law, compared with the appropriations for the Bureau for the present fiscal year, under current law:

Items.	Appropriation suggested for the organized Bureau.	Appropriation for 1914 under current law.
Salaries for Bureau.....	\$142,130	\$104,860
Promoting commerce (commercial agents).....	100,000	60,000
Collating tariffs		10,000
		174,860
Investigation work under law transferred from Bureau of Labor Statistics.....	100,000	50,000
Commercial attachés.....	150,000	
Promotion work in Central and South America.....	100,000	
	592,130	224,860
Printing and binding (suballotment from Department allotment).....	160,000	135,000
Contingent expenses (allotment from Department appropriation).....	7,500	3,500
Total	759,630	363,360

The sum of approximately \$760,000, suggested as necessary for the proper work of this Bureau, is less than two-hundredths of 1 per cent of the commerce passing under the review of this Bureau during the last year.

Possibly I may have erred in not asking a more adequate provision for this great work. Certainly it is not consistent with our national self-respect to ask for less. It should be noted, finally, that now is the appointed time. We have spent several hundred millions preparing the Panama Canal and the nations of the world have been getting ready for its use while we have done almost nothing actively to promote the commerce which should repay the nation, in part at least, for this vast outlay.

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BUREAU OF CORPORATIONS.

SCOPE OF PAST WORK.

Heretofore specific industries, such as beef, oil, tobacco, lumber, steel, water transportation, water power, harvester, and cotton exchanges, have been the subject of investigation by the Bureau of Corporations. They have been isolated, intensive investigations, each conducted without reference to the plan of the other, except as general conditions demanded. Their value has been immediate and local in the sense that they have each been confined to one specific subject.

STATUS OF PENDING INVESTIGATIONS.

Of these old investigations those on lumber, tobacco, water transportation, the harvester industry, and corporate taxation remain to be concluded by the publication of additional reports, but all of them will probably be closed up within the next 12 months. In addition to these are the new investigations now pending pursuant to Senate resolutions, to wit, investigations of the fertilizer industry, the relationship of the Oklahoma oil fields to the general oil market, and the cotton pool. The two former are broad subjects, and will require considerable time for their investigation and report thereon.

The following additional investigations are being pursued at the present time:

Administrative commissions.—A comparative analysis of the laws of foreign countries and of the various States creating administrative commissions is now under way. A comprehensive understanding of what other governments have done, what weaknesses have developed, and what attributes are essential in the formation of administrative commissions will undoubtedly be of assistance in future legislation.

Conflict of State laws relating to foreign corporations.—Each Commonwealth of the Union has its distinctive laws with reference to corporations foreign to its jurisdiction. This has resulted in a wide divergence in the prerequisites for doing business in the various States with respect to interstate corporations. The penalties imposed for technical failure to comply with such prerequisites are in many instances drastic and severe. This condition has often seriously hampered and restricted the business world. It has neces-

sitated the retention by practically every large concern engaged in interstate commerce of an attorney who devotes himself to a study of the laws of the various States, so as to preserve the rights of lien and other contract rights of the particular corporation in its interstate activities. The amount of money actually lost by corporations due to unknowing violations of the laws of different States is undoubtedly very large. The Bureau proposes, therefore, to make an exhaustive study of the laws of the various States on this subject and to prepare a model system of regulation of foreign corporations, with a view to cooperating with State legislative committees in the modification of their laws. It is believed that if, as a result of this investigation, the Department is able to advise corporations doing an interstate business that at least in a number of States (naming them) a uniform system of regulation of foreign corporations has been established, a great and constructive piece of work will have been done for the benefit not only of the business world but of the respective communities as well.

Trade agreements.—An investigation of trade agreements is also in progress, with a view to establishing some facts as to what agreements, if any, apparently in restraint of trade, are really in aid of competition and should be exempted from the operation of the Sherman Act.

Fixed price for resale of articles.—There is also the investigation now pending with reference to the merits and demerits of a condition which prohibits a uniform price from being fixed by manufacturers and jobbers, binding upon retailers, as to articles of their manufacture.

Foreign laws on trusts, cartels, etc.—A comparative study and analysis of the laws of foreign countries with reference to the regulation by government of trusts, monopolies, cartels, etc., is now being made. Such a study of the laws of England, Germany, France, Canada, Australia, and New Zealand, and an authoritative statement of what they are, should prove of value.

FUTURE WORK.

The organic law of the Bureau provides:

The said Commissioner shall have power and authority to make, under the direction and control of the Secretary of Commerce, * * * diligent investigation into the organization, conduct, and management of the business of any corporation, joint stock company or corporate combination engaged in commerce among the several States and with foreign nations excepting common carriers * * * and to gather such information and data as will enable the President of the United States to make recommendations to Congress for legislation for the regulation of such commerce.

In order to accomplish the said purposes, the Commissioner is given power to procure testimony and facts by subpoena, including

the power to compel the production of books, papers, etc. It is therefore within the power of the Bureau of Corporations—indeed, it might be stated that it is the duty of the Bureau of Corporations—to gather information of a broader and more comprehensive character with reference to industrial conditions pertaining to interstate commerce, so far as they have to do with corporations, than would be entailed in the investigation of isolated industries.

To be sure, the character and nature of the work of the Bureau of Corporations will be dependent upon the outcome of congressional action at the ensuing session of Congress, which will doubtless legislate with reference to the trust problem; and practically all of the bills submitted regarding this matter contain some reference to certain activities to which the Bureau may address itself, either as a part of the action of a commission or independent thereof.

There are two matters which ought to be handled by some governmental agency—the one is immediate and administrative; the other is fundamental and economic—and it lies within the power of the Bureau of Corporations to do this work under the present status of the law.

(1) *Reports of corporations.*—There are constant demands upon the Bureau for information with reference to certain particular corporations, which should be a matter of public information, but which it is unable to give at the present time. Some governmental agency should be clothed with the power and the duty to obtain and preserve as a public record facts with reference to interstate corporations, especially with respect to the larger companies. Where size limitations have been fixed, a gross business of \$5,000,000 has been generally accepted as the minimum standard in practically all bills introduced and pending in Congress, but certain facts should be required from smaller concerns in order to determine, among other things, the degree of control which large corporations possess in any particular branch of industry. These facts could be obtained by schedules to be prepared by the Bureau and submitted to corporations to be filled out and returned. The information sought might include copies of charters and by-laws; names of directors and officers; kinds and amounts of capital stock, bonds, and other similar obligations; statements of assets and liabilities and of profit and loss, or income; dividends, both cash and stock; the names of other corporations in which it holds stock, and names of other corporations which hold its stock, and the respective amounts held; other companies in which its officers or directors are either officers or directors, and their stockholdings in such other companies; agreements made with other corporations engaged in a similar or related business with respect to control of markets or territory, price fixing, etc. Such returns should be made annually, and in connection with the first annual return additional

information regarding the original organization and capitalization of the corporation would probably be desirable, together with the stock or other consideration paid to promoters or underwriters. The careful analysis and coordination of this mass of information would shed a degree of light upon conditions that would be of great value to the President and to the country in considering the problem of control. This work would probably require a force equal to the present force of the Bureau.

(2) *Fundamental and economic question: The efficiency of trusts.*—That there are immediate and well-known conditions that should and can be remedied by law is apparent. Some of these remedies are, for instance, a law providing that there shall be a presumption that all restraints of trade are unreasonable, and placing the burden of establishing the reasonableness of such restraint upon the party alleging it; legislation looking to fundamental charter provisions for every corporation doing interstate business, that stocks and bonds shall not be issued except for money or property at its true money value, preventing the watering of stocks; that corporations shall not hold stock in other competing companies, and that neither a person nor a corporation shall at the same time own a controlling interest in two or more competing corporations, or that the officers of corporations shall not be affiliated directly or indirectly by holding office in other corporations.

Congress will undoubtedly address itself to some of these aspects of the situation with curative provisions. Regardless of such legislation, however, there still remains a fundamental economic fact to be determined, to wit, whether the trust or monopolistic form is socially and economically efficient in production, as is alleged; and upon the solution of this problem must depend the ultimate attitude of government toward combinations and consolidations in business. It is contended by some that with the increase in the size of industrial enterprises there goes a reduction in the cost of extraction, manufacture, and distribution, and that such reduction in cost is accompanied by lower prices to the consumer and does not involve a reduction in wages or an impairment of the conditions of labor. Even if these conditions were true, the question would still remain, of course, whether the evil resulting from large combinations would not be greater than the alleged advantages of cheaper production. It is contended, on the other hand, that the source and origin of monopoly is found chiefly in the desire to exploit the general public by stock-jobbing schemes for the immediate profit of the promoters or in the purpose to attain control of the market and exact unduly high prices from the consumer. Many large combinations have failed and demonstrated their economic inefficiency. Combinations which have attained control of the market, it is admitted, have prospered, but this

may be due to monopolistic position rather than to superior efficiency. According to this view, there is a point beyond which increase in size does not result in increase in efficiency, but rather in loss and waste, so that the maximum efficiency is not attained by large combinations, but by concerns of moderate size. If the latter contention be true, then, as has been said, the monopolistic system contains in itself the seeds of its own decay, and the proper attitude of government must be regulation of competitive conditions and not regulation of monopolistic factors.

No governmental agency is engaged in the attempt to secure facts in a scientific manner directed to this problem. The problem perhaps can not be solved dogmatically; but a careful, painstaking investigation would undoubtedly bring a great volume of facts, an analysis and study of which could not but throw great light upon the question.

Here, then, are two functions which the Bureau of Corporations could perform, conditioned, of course, upon its being furnished with the necessary appropriation.

In connection with this matter, permit me to call your attention to a practice which has grown up whereunder certain matters are referred by congressional resolution to the Bureau of Corporations for investigation. By this avenue there have come to the Bureau in the past investigations which in themselves would consume the Bureau's entire appropriation. These investigations are all of immediate importance, but for the greater part are of local rather than general interest. The Bureau of Corporations is desirous of performing this very useful function, and is splendidly equipped to so do; but to pursue investigations of this character would necessarily absorb the entire resources at its command, with the result that a constructive policy along a definite line would be impossible. It is therefore strongly urged that resolutions of this kind directed to the Bureau of Corporations contain appropriations for such investigations.

BUREAU OF STANDARDS.

The past fiscal year has been the most active one in the Bureau's history. In addition to its regular activities in testing and research, several new lines have been developed, the new electrical building has been completed, additional land has been purchased, numerous technical conferences have been held, and a sharp increase has occurred in the demands for the Bureau's cooperation in connection with public-utilities regulation. In spite of the technical character of the Bureau's work, its direct and intimate relation to the interests of the general public have given it opportunities for usefulness of unusual promise. Notable among its lines of work have been the success in its movement for honest weights and measures in daily trade, its cooperation in the more precise application of temperature control in the industries, its completion of fundamental work on electrical standards, the development of optical work, particularly with regard to photometric and color standards, and progress made toward establishing standards of quality for materials, and standards of regulation affecting public utilities. As a testing laboratory for the Government service, the Bureau has given assistance to various departments and independent establishments in the purchase of supplies by specification and test.

The appropriations for the year provided for the purchase of about 8 acres of land adjoining the present site, for the completion of the new electrical laboratory, for the completion of the large tension-compression testing machine, and for several special investigations, including the determination of refrigeration constants, the investigation of the effects of electric currents, and work on structural materials.

The testing of standards, weights, and measures, measuring instruments, and materials has been continued along with the research work in the various divisions and included 63,365 distinct tests. In addition, about 25,000 spring scales were critically examined at the factories for the parcel-post service, about 16,000 samples of cement were tested for the Isthmian Canal Commission and others, and about a million and a quarter incandescent electric lamps furnished on Government contracts were inspected. Approximately one-fourth of the laboratory tests made at the Bureau were for the public. These comprised standards and measuring instruments for heat, light, electricity, length, mass, capacity, pressure, and others. Since the

testing of materials is not done for the public except under certain conditions, the Bureau's work on materials is the development of standards of quality and methods of testing, and in this manner it renders important service to industrial testing laboratories.

However important the testing—and its importance is being increasingly recognized—the Bureau's investigations into technical problems of standards, methods of measurement, tolerances, measuring instruments, legislation and regulation, and the standards of quality of materials must be recognized as of the utmost importance. The Bureau is not only called upon by all departments of the Government but by public-service commissions of cities and States, by State and municipal governments, manufacturers, and public-utilities companies, for experimental and other research for which the Bureau is peculiarly well fitted and for data which is in many cases at hand. The work of the Bureau of Standards in aiding the States and cities in formulating the scientific and technical details of legislation has been particularly appreciated and its services have been in constant demand for this purpose. In this work the Bureau serves in a purely advisory and cooperative capacity, but it is believed that its work has been none the less effective, since its decisions have been arrived at through unbiased laboratory and field investigations by competent specialists.

WORK FOR MUNICIPALITIES AND STATES.

One of the most widely felt needs among the States and municipalities was for a uniform weights and measures law. Such a model law was prepared through the efforts of the Bureau and has been approved by the sixth weights and measures conference at the Bureau and is under consideration in numerous States. While ideal uniformity is not to be expected, the results are gratifying. Among the States which have requested and received the aid of the Bureau in this respect are California, Illinois, Indiana, Iowa, Kansas, Michigan, New Hampshire, Pennsylvania, and Texas. As far as local conditions permitted the provisions of the model law were adopted.

Another example of cooperation in the technical details of legislation is furnished by the model laws and regulations prepared by the Bureau on the subject of illuminating gas. These were the outcome of comprehensive investigations in the laboratory and in the field on the standardization of the manufacture, distribution, and use of gas, and embody the results of the best experience. In this work the Bureau has had the valuable cooperation of gas experts in all parts of the country. The Bureau's model regulations now form the basis of advanced legislation upon the subject of illuminating gas. These standard regulations have been published by the Bureau and will be revised from time to time as technical progress requires.

Among the subjects studied were measurements of purity, heating value, candlepower, and the pressure of the gas—all important factors in an efficient gas service. This is a type of work which must be done in connection with all kinds of public utilities, the regulation of which is rapidly passing from legislative bodies to public-service commissions.

An investigation of great interest to cities is the recently completed study of the effects of electric currents upon underground structures such as gas and water pipes, reenforced concrete foundations of buildings and bridges, and other underground structures. In such cities as St. Louis, Chicago, and Philadelphia the electrolysis problem is a serious one. The Bureau's work, which will soon be published, resulted in a model survey which may be applied to cities and in a compilation of the means by which the effects of such currents may be minimized or entirely avoided.

Other examples of the technical service rendered cities might be cited, such as the investigation of the photometry of street lamps for the cities of Washington and Philadelphia, which proved of particular service to these cities and resulted in greatly improved service.

With the rapid increase in the number of State and municipal public-service commissions, the variety of technical problems which arise in connection with the regulation of public utilities will increase accordingly. The Bureau has demands for its cooperation in an advisory capacity and much technical work has been done for these commissions. The importance of such work and the high class of experts required necessitate a special provision for it.

WEIGHTS AND MEASURES OF COMMERCE AND TRADE.

Among the important events of the year has been the Eighth Annual Conference on Weights and Measures, held at the Bureau of Standards in May. Twenty-five States, twenty-nine cities, a number of railroad scale inspectors, and manufacturers of weighing and measuring apparatus were in attendance. Through these conferences the Bureau exerts a far-reaching influence toward uniformity of practice and regulation in the local inspection service in the States and cities, with the most favorable effect upon the weights and measures of daily trade.

In cooperation with local inspection service of States and cities, the Bureau will supplement the local facilities by taking up the testing of large scales, such as warehouse and railroad scales, for which the equipment of local sealers is inadequate. This work is particularly imperative in the testing of the large scales used in the interstate shipments of commodities where both Federal and State governments will cooperate. The Bureau has contracted for a test car,

the construction and equipment of which is a distinct improvement in type and will mark an important step forward in such work. The railroad, elevator, and other scales used in weighing commodities for interstate shipment will, it is hoped, be placed on a basis where both shippers and railroads may have confidence in freight weighings involving approximately \$2,200,000,000 annually.

The data from this investigation of large scales will facilitate the design and construction by manufacturers of such scales as will embody the best engineering features in accord with the carefully worked out theory of the operation of such apparatus. Several technical papers upon the theory and design of scales were prepared for the eighth annual conference. A study of the entire situation has brought out forcibly the defects in construction, testing, and maintenance of such scales. In this connection may be mentioned the assistance to the Post Office Department in establishing the parcel-post service scales upon an efficient basis. The Bureau aided in preparing the specifications and tolerances, and examined critically the many models submitted to obtain the best scale for the purpose of quick and accurate weighings. The Bureau tested and inspected many thousands of the scales at the factories. The results of these tests proved the necessity of the most careful inspection of measuring and weighing apparatus, even when submitted on carefully drawn specifications. Many thousands of seriously faulty scales were rejected.

ESTABLISHMENT OF STANDARDS.

The Bureau is cooperating with the national standardizing laboratories of England, Germany, and France, with a view to international agreement on the standard temperature scales used by the several institutions, and there is excellent prospect for satisfactory agreement. Much information was furnished to a number of laboratories, both industrial and in the Government departments, on specifications for high-grade mercurial thermometers and on complete temperature equipments for scientific work requiring the highest accuracy. By this work the Bureau is establishing throughout the country the standard scale of temperature, an essential factor in all industries involving temperature measurements.

Standards of color are urgently needed for grading commodities, since many articles are purchased upon color specifications. For example, cottonseed oil is commercially graded according to color, the color being a factor in fixing the price. Disputes between buyer and seller, involving thousands of dollars, arise from diverse methods of testing color. The Bureau was appealed to in the matter by the Society of Cotton Products Analysts, and in cooperation with that society and with the New York Cotton Exchange, the Bureau has

undertaken to establish standards of color and standard methods of color testing.

The Bureau investigated experimentally the basis of standardization used in polarimetry of sugars and found that the 100-degree (or 100 per cent pure) point was in error by being placed one-tenth of 1 per cent too high. As a result of the Bureau's work, the International Sugar Commission has appointed a committee, representing the Bureau of Standards, the Austrian Sugar Institute, the German Sugar Institute, and the Physikalisch-Technische Reichsanstalt, to make proper recommendations. As all transactions in sugar the world over are made upon the basis of the polarimeter readings, the importance of a precise value of the 100-degree point is self-evident.

The urgency of establishing refractive index standards arises from the rapidly increasing use of the refractometer as a means of accurately detecting impurities in liquids. In radiometry, the Bureau has established a standard of radiation and now issues radiation standards in the form of electric incandescent lamps, calibrated so as to give in absolute units the energy radiated from the lamp. The need of measuring photostimuli radiometrically is growing among physiologists and psychologists and much time has been given by the Bureau in advising them as to measuring equipment and methods of measuring radiation. Information and advice was also given to meteorologists and astronomers engaged in solar radiation work.

RESEARCH AND TESTING.

In every branch of the Bureau's work research is a prerequisite to establishing standard methods of test, and it usually develops that each line of testing gives rise to problems which require research of an exacting order. This makes it essential that research and testing be combined. From the establishment of the Bureau this has been its policy, and with industrial advance the need for research upon methods of measurement and upon physical constants becomes more pressing.

The investigation of aneroid barometers is important on account of the interest taken by the Government and the public in aviation, flying machines often being accepted upon the indications of these instruments, which sometimes vary in rating over 50 per cent under different conditions. Many makes of these instruments are on the market, and the Bureau made a critical investigation to determine their accuracy when affected by temperature changes and when operated under rising and lowering pressures at different rates. As a result, the Bureau has developed standard methods of test and certification for aneroid barometers and a circular has been prepared for publication covering the subject.

In view of the present demands for aeronautical data, the Bureau will make comparative tests of instruments, motors, and propellers and the materials used in aviation work, and will make exact determination of such aerophysical constants for which the Bureau is equipped.

The development of methods of determining the expansion of materials from room temperature to 700 degrees centigrade (1,260 degrees Fahrenheit) is completed and the equipment installed, and a number of specimens already studied. Facilities will soon be available for extending the range down to the temperature of liquid air. This data, especially in the higher ranges of temperature, is of great importance in the use of structural materials.

Much experimental work has been done upon the determination of refrigeration data. An important constant has been practically established, namely, the latent heat of fusion of ice. Many constants of fundamental importance are to be determined, and the Bureau is receiving the hearty cooperation of the American Society of Refrigeration in this work. Each important constant will be determined by at least two independent methods to insure the highest reliability.

In photometry, besides the work on street lighting, the Bureau has done work on headlights and signals and prepared a report on proposed headlight legislation. The Bureau cooperated with the Baltimore & Ohio Railroad and the Post Office Department in studying the most effective postal-car lighting, which resulted in improved specifications for this purpose. The Bureau also assisted the Navy Department in the preparation of specifications, designing and testing of optical apparatus, recording cameras, etc. .

The construction of a 400-foot testing tank for rating water-current meters is nearly completed; approximately 200 such meters were calibrated for different Government departments during the year. Many tests of anemometers, tachometers, fire extinguishers, steam, vacuum, and air gauges, and miscellaneous engineering instruments were made. The critical examination of measuring instruments of all kinds by the different divisions of the Bureau has resulted in direct improvement in such products. Makers of these instruments visit the Bureau to ascertain causes of failure and have appreciated the Bureau's specific criticisms which often result in immediate improvements. Likewise the Bureau is indebted to manufacturers and industrial experts for the most cordial cooperation in every branch of its work.

MATERIALS—TESTING AND RESEARCH.

The insistent demands made by the public for researches as to methods of measurement, properties of materials and finished products is due to the fact that efficiency is the keynote in industry and

that measurement is the chief means used to solve its central problems. The Bureau of Standards has facilities and experts for this purpose. Its work on cement illustrates a line of attack upon the problem which is applicable to nearly all materials and products. The Bureau is studying the effects of each factor affecting the quality of cement, its composition, the time and temperature of burning, the fineness of grinding, etc. Through the efforts of the Bureau the Government has adopted standard specifications for cement that are accepted by manufacturers and engineers. The Bureau standardizes the methods of testing cement for its several properties, devises and standardizes the instruments for such tests, studies the significance of each test, and actually tests and certifies many thousands of samples of cement used by the Government in its larger enterprises. The Bureau is now equipped with an experimental cement plant with which it tests directly the suitability of materials for cement making and studies the specific effect of varying such condition of manufacture in a systematic manner. The properties of cements are thus studied by full laboratory tests and by service tests.

Special researches are conducted upon the strength and life of cement and concrete in actual use, e. g., in sea water and when exposed to the western alkali waters and to other conditions in service. The strength of cement and concrete are also studied by testing machines in the laboratory and by strain gauges in structures during and after erection. In this manner the manufacture and utilization of cement becomes a measured process throughout and under complete control in proportion as the results are applied in industry. The Bureau aims to apply a similar program to all industrial materials, such as metals, clays, limes, paper, textiles, rubber; structural materials, such as building stone, brick, tiling, paints and other protective coatings, and to miscellaneous materials. The aim is to acquire so definite a knowledge of the properties which fit a material for its use and the conditions under which those properties may be unfailingly reproduced in order that producer and consumer alike will be assured of high quality and steady improvement in each material and manufactured product. This comprehensive program will tax the Bureau to its utmost and will involve the most searching and difficult scientific investigations of every detail affecting the quality of the material.

The theory on which this work is based is, briefly, as follows: First, the investigation and identification of those properties upon which the quality of a material depends, and second, the defining of these qualities in such a manner as to permit of their specification and measurement. The material should be made under such measured conditions that the quality is assured and not left to chance or per-

sonal judgment alone; it should be tested in advance of its use and if possible during its utilization in manufacturing. Finally, the conditions affecting the life and efficiency of a material should be studied in actual service, since this unites all the factors which affect its usefulness. It is becoming generally recognized that standards of quality must be developed for specific uses based upon accurate measurements of the properties which in each case determine the quality sought.

Cooperation between the Bureau and manufacturers has been found the most practical method of making its work effective. A striking readiness on the part of manufacturers to cooperate has greatly aided the Bureau in the difficult problems involved. An illustration may be found in the conference held at the Bureau during the year on the subject of paper. Government users, manufacturers, testing experts, and purchasing officers were represented; the discussions showed that there is no lack of interest in the effort to place the testing, specifications, and utilization of paper upon a scientific basis. Similar conferences are being held for the discussion of textiles, rubber, and other materials. Again, the Bureau keeps in close touch with manufacturers by visits of its experts to mills where a frank discussion of materials and methods of manufacture has been of mutual benefit. Manufacturers and testing experts in turn visit the Bureau, and by a free interchange of information misunderstandings are cleared up and a basis for the most cordial cooperation is established.

Among the researches on materials a few illustrations will show the nature of these problems. An investigation of the manufacture of true porcelain from American materials is well under way, with a view to encouraging in this country the manufacture of this and other pottery products now exclusively imported. Numerous studies in various phases of the ceramics industries have been published by the Bureau which are of direct application to these industries. The Bureau, in cooperation with the American Institute of Metals, is engaged in the preparation and testing of bronzes and brasses for the purpose of developing specifications for such alloys. An investigation is in progress upon the causes of failure of railway materials, especially car wheels, axles, and rails. Mills have been visited and measurements of rolling temperatures recorded and other data compiled for study.

The research on the volumetric changes in concrete structures owing to temperature variations and chemical reactions during the hardening of the concrete is being continued. This is a type of fundamental investigation upon vital factors affecting the utility of a material. In cooperation with other departments and with the Cement Manufacturers' Association, the Bureau has undertaken to study the effect of alkali waters on cement as used in irrigation and

other projects. The results of a research on the process of hydration of cements are being prepared for early publication.

The behavior of rubber from the crude to the vulcanized state is being investigated by the Bureau with the hearty cooperation of rubber manufacturers. Excellent progress has been made on standard methods for rubber analysis and for the physical testing of rubber. Of immediate interest to lithographers, color-process printers, and chart and map makers is the study of the stretching and shrinkage of paper during the printing processes. This is with a view to overcoming these serious defects which now are a source of great loss to the trade. Solutions proposed lie in the direction of humidity control and the development of minimum-shrinkage papers. A conference was held at the Bureau to establish textile specifications and uniform methods of testing. Investigational work in textiles was done for the Treasury Department in the analysis of imported bagging for cotton and other materials, and for the Ways and Means Committee on technical problems involved in revising the tariff. Considerable work was done in many other lines toward establishing specifications for goods to be purchased by the various departments of the Government and testing deliveries of goods in order to ascertain their conformity to these specifications.

The specific electrical resistance and temperature coefficient of copper—constants of the greatest importance to the electrotechnical industries—have been experimentally determined and the results have been adopted not only by the interested technical societies in America but are also now recognized abroad as authoritative. Wire tables for cables based on these experiments were computed and will soon be issued.

Excellent work has been done in determining the physical constants of alcohol, in studying the chemistry of paper, in preparing specifications for oils, varnishes, turpentine, pigments, inks, asbestos, and in other chemical lines. The investigation, begun some time ago, with the purpose of correlating the magnetic, electric, and mechanical properties of iron and steel has already yielded important results and when completed promises to be of great practical utility as a reliable means of testing rails for soundness and safety.

Several new materials have been added to the excellent series of standard samples of irons, steels, and other materials prepared, certified, and distributed by the Bureau for use of technical chemists and fuel experts in checking the accuracy of their laboratory methods. The demand for these standard materials has increased greatly.

During the year the large testing machine of the horizontal type for specimens up to 33 feet in length was completed. Tensile tests up to 1,150,000 pounds and compression tests up to 2,300,000 pounds may be made. In cooperation with the American Society of Civil

Engineers and the American Railway Engineering Association a series of column tests will be made for the verification of the formulas used in engineering design.

Supplemental to the work of the testing machines is the strain-gauge work. The strain gauge is used to measure the strains and indirectly the strength of structures during erection and later in actual service under working loads. The method is one which will afford engineers, builders, and others to check the correctness of design and the safety of structures. Experimental tests of the method have been made on large bridges, tall office buildings, on the hulls of ships at sea, on the lock gates of the Panama Canal, and on concrete street pavements.

The Bureau cooperates whenever possible with all researches which tend to minimize life hazard. The work in structural materials affords much data useful in minimizing the dangers resulting from defective materials. The scientific study of materials, not only in avoiding the loss of life and property but by increasing the efficiency of materials, is one of the important fields of usefulness of the Bureau. At the request of the Interstate Commerce Commission, the Bureau investigates the causes of railroad accidents so far as they relate to defective materials, and the Bureau's reports upon defective rails have brought sharply forward the urgency of thoroughly studying this problem. The Bureau is preparing a program for the study of the life hazard involved in high potential electric currents and in lightning discharges. The fund provided by Congress for this purpose should result in practical results of great value in reducing such dangers. In connection with the Navy Department, the Bureau made an experimental observation of sea-water temperatures in the vicinity of icebergs to furnish data for those interested in possible methods of ascertaining the presence of icebergs.

Great progress has been made toward making the work of the Bureau of Standards available and useful to the public, by the publication of scientific and technical papers, circulars of information, conferences on specific subjects, and through the technical press. Nevertheless, every effort will be made during the coming year to make it a more effective factor in solving the great problem of efficiency—the basis of all progress in science and industry.

BUREAU OF THE CENSUS.

A very considerable part of the Census Bureau's activities during the fiscal year was in connection with the deferred work of the Thirteenth Decennial Census. The usual annual investigations regarding financial statistics of cities, production and consumption of cotton, vital statistics, and forest products were conducted; and in addition, work was done on the tobacco inquiry (authorized by act of Congress approved April 30, 1912) and the quinquennial census of electrical industries.

The last-mentioned inquiry relates to the calendar year 1912. The preparatory work was commenced in the latter part of that year, and the actual collection of statistics was begun early in 1913. By the end of June the canvass had been finished in 19 of the 76 districts and satisfactory progress had been made in the others, although in 6 of the cotton-growing States it had been found necessary temporarily to withdraw clerks in the field from the electrical-industries work in order that they might be utilized for the selection and instruction of local cotton agents.

PROGRESS OF DEFERRED THIRTEENTH CENSUS WORK.

Volumes VI and VII, on agriculture, and IX, on manufactures, of the final reports of the Thirteenth Census were issued during the fiscal year. There were also issued 50 of the 53 editions of the Abstract of the Census (one without supplement and each of the others with a supplement for a particular State or Territory); those for Alaska, Hawaii, and Porto Rico were the only ones remaining to be published after June 30, 1913. The Abstract contains, in condensed form, with text discussion, all the important results of the census for the United States as a whole, except the statistics on occupations, on mother tongue, on ownership of homes, and on the dependent, defective, and delinquent classes; and in the State supplements is given complete and detailed information on all subjects covered by the census except those just named. The publication of the results of the Thirteenth Census was, therefore, much nearer completion at the end of the fiscal year than would appear from the fact that only three of the final volumes had been issued at that time. The work on the other volumes has been progressing, and Volumes II, III, V, and VIII have been issued since the close of the fiscal year;

the others will be out in a short time, as practically the only work remaining to be done on them is in connection with their assembling, proof reading, and printing.

The tabulation of statistics of occupations and of the dependent, defective, and delinquent classes had been deferred in order to bring the remainder of the work to completion as soon as possible, so that these lines of work were much further in arrears at the beginning of the fiscal year than were the others. Satisfactory progress was made on the occupations statistics, and at the close of the fiscal year most of the machine work had been finished. Considerable work was done on the statistics of dependent, defective, and delinquent classes during the fiscal year, but this branch of the work is not as near completion as the others.

The compilation of the statistics of mines and quarries also was not as near completion at the end of the fiscal year as most branches of the Thirteenth Census work; and it has since been decided to expedite the publication of the final report on Mines and Quarries (Volume XI) by abandoning the original scheme of issuing separate monographs on the leading mining industries, with the exception of those relating to anthracite and bituminous coal, iron ore, petroleum, and natural gas.

The cost of clerical help for the Thirteenth Census work carried on during the year was more than double that for all other Census work combined.

ADDED WORK IMPOSED BY NEW LEGISLATION.

In April, 1912, Congress passed an act providing for the collection, as of October 1 and April 1 of each year, of statistics regarding the stocks of leaf tobacco held by manufacturers and dealers. The first report under this act was made on November 27, 1912, and was received with much interest by those engaged in the tobacco trade. The second report was made on May 26, and the third on November 13, 1913.

At the same session of Congress a law was enacted providing that statistics of the consumption, stocks, exports, and imports of cotton and of the number of cotton-consuming spindles should be collected by the Bureau of the Census monthly instead of quarterly, as had been the practice, and making certain minor changes in the method of publishing the statistics of cotton production. The purpose of this legislation was to furnish producers of cotton with information concerning demand as frequently as consumers are furnished with statistics as to supply.

These two acts of Congress have materially increased the work of the Division of Manufactures of the Census Bureau. The appropriations for carrying on this additional work have been much

smaller than were requested, but the Bureau has endeavored to make the best use possible of the funds provided.

In January, 1913, there was published a mid-season report showing the amount of cottonseed crushed and linters obtained during the ginning season up to December 31. Theretofore such data had been published annually at the end of the cotton season.

WORK FOR THE FISCAL YEAR 1914.

In view of the delay in the publication of the results of the Thirteenth Census, the Director, early in the fiscal year 1914, appointed a committee consisting of the chief statistician for manufactures, the chief clerk, and the expert special agent in charge of the Division of Agriculture to investigate the work in all the divisions of the Bureau and to make recommendations which would lead gradually to a complete reorganization. This committee accumulated a large quantity of material and made a number of recommendations which resulted in great improvement of certain branches of the Bureau's work.

It is the special desire and purpose of the Director to bring the work up to date, and to this end he deemed it essential to have the assistance and advice of persons who were outside of the Census Bureau but were familiar with its work. He accordingly selected for this purpose Hon. S. N. D. North and Hon. W. R. Merriam, former Directors of the Census; Prof. Walter F. Willcox of Cornell University, who had been a chief statistician in the Bureau during the census of 1900 and who for the greater part of the time since has been connected in some capacity with the work of the office; Mr. W. S. Rossiter, who had been a chief of division and later chief clerk of the Bureau, and Hon. Daniel C. Roper, First Assistant Postmaster General, who had been an expert special agent and chief of division in the Census Bureau. These gentlemen, with the exception of Mr. Roper, were given appointments as expert special agents. After examining the material and recommendations made by the committee of the regular employees of the office, they conducted an independent investigation of conditions in the Bureau, conferring with the chief statisticians and other officials who were in charge of the different branches of the work. They found that, while the larger proportion of the work of the Thirteenth Census had been finished, nevertheless a considerable quantity of statistical information collected at that census still remained to be tabulated and published. The most serious delay was in the work on statistics of occupations. This, however, as already stated, had been deferred, along with certain other branches of the work, in order to permit the publication of the balance of the reports at the earliest possible date. The work on some of the annual reports of the Bureau—in particular,

Financial Statistics of Cities, 1912, and Mortality Statistics, 1911 and 1912—was also far in arrears.

The expert special agents advised the Director that no additional tabulations or analyses should be undertaken in connection with the unfinished branches of the Thirteenth Census work, and that the work on those branches and on the delayed annual reports could and should be curtailed so as to insure their publication not later than December 31, 1913. The recommendations of the expert special agents are as follows:

1. That the proposed second machine run of the cards for the purpose of subdividing occupations be abandoned, thus expediting the time of production by about six months and reducing the cost of finishing that branch by about \$50,000, and that the tables yielded by the first run of the cards be printed without derivative tables or text. These tables give the number of persons of each sex in each occupation, and classify them by race, nativity, and parent nativity, and five age periods, thus insuring the publication of the primary classification of occupational data as reported at previous censuses.

2. That the report upon native tongues be limited to the chapter to appear in the forthcoming final volume on population.

3. That the tables relating to mines and quarries now in the form of printed tables, proofs, or manuscript be sent to the Public Printer at once, the same to constitute the final report on mines and quarries, and that no further tabulation or text be prepared in connection with that report.

4. That tables for the benevolent institutions, and for the institutional population, namely, prisoners, insane and feeble-minded, and paupers—be prepared without further percentage or other derivative tables and without text.

5. That the annual compilation of the statistics of forest products be abandoned. There appears to be no authority of law for an annual inquiry of this kind, which the records show to have cost from \$20,000 to \$40,000 a year.

6. That the annual report on financial statistics of cities for 1912 be completed and published by January 1, 1914, by curtailing the amount of detail to be included, and the schedules and report for 1913 be similarly curtailed; that the reports for the years 1912 and 1913 be printed without text, except such as may be required for explanation and definition; and that until the annual reports on the financial statistics of cities are brought up to date, no attempt be made to publish a report on general municipal statistics. This recommendation is necessary to prevent delay in the compilation and publication of the annual report on the general statistics of cities from seriously from their value.

7. That the annual report on birth and fertility statistics for the years 1911 and 1912 be published at the close of the present calendar year. To make this possible, the amount of detail to be included should be reduced to a minimum or omitted, the tables on the subject should be reduced to a minimum, and a report on births until the mortality statistics are published.

8. That the work upon the standardization of death rates, life tables, and occupational mortality be suspended until the above reports have been published. It is suggested that the annual mortality report for each year should not be completed until the first of the close of the succeeding calendar year.

9. That the delay in completing the Thirteenth Census has caused the Director in requesting the Secretary of Commerce to lay the matter before the President with the view of securing his instructions to the Director to give precedence so far as practicable to the remaining publications of the Thirteenth Census and the annual report.

These recommendations are being followed, and it is believed that the deferred Thirteenth Census work and the delayed annual reports will be completed and published before January 1, 1914.

Official Register.—Work on the Official Register for 1913 is progressing as rapidly as possible. The necessary information has been obtained from the several departments and offices, and its compilation is now well toward completion.

As a result of suggestions made by the Department of Commerce, the following provision was incorporated in the urgent deficiency bill approved October 22, 1913:

Hereafter the Official Register of the United States shall not contain the names of those persons heretofore published in Volume II relating to the postal service, namely, postmasters, assistant postmasters, clerks in post offices, city and rural carriers, employees of the sea-post service, employees of the Railway Mail Service, employees of the mail messenger service, and mail contractors; nor shall it contain the statement of allowances made to contractors for carrying the mails or the list of ships and vessels belonging to the United States, as heretofore published in the said Official Register; and all Acts or parts of Acts inconsistent with the foregoing provision are hereby repealed.

This legislation will greatly simplify the preparation of the Official Register and will very materially decrease the expense of the work. Heretofore it has been necessary to obtain the names of the employees of the Postal Service by correspondence with each postmaster in the United States. The number of such employees on June 30, 1913, was 290,605. Volume II of the last edition of the Register (1911) contained 774 pages, and the cost of printing alone was \$12,600. It is believed by the Department of Commerce and by the Post Office Department that the practical value of this volume has not been sufficient to justify the labor and expense involved in its preparation.

The Director of the Census has called attention to the fact, already pointed out by his predecessor, that the Official Register in its present form (even with the names of postal employees omitted) is unnecessarily expensive and cumbersome. He believes that the following plan, which modifies slightly the one proposed by his predecessor, will, if adopted, result in very material saving to the Government and will at the same time preserve all the valuable features of the present Official Register:

(1) The establishment of a card directory, prepared and maintained by the Civil Service Commission from information furnished by the executive departments and independent offices, showing the name and status of every person in the Government service except the officers and enlisted men of the Army, Navy, Marine Corps, and Revenue-Cutter Service. Lists of officers of the Army, Navy, and Marine Corps are already published annually in the Army Register and Navy Register, issued by the War and Navy Departments, respectively.

(2) The elimination from the Official Register of detailed lists of all employees, by name.

(3) The publication annually by the Bureau of the Census of an official register containing—

(a) A list of all employees of the Government (except officers and enlisted men in the Army, Navy, Marine Corps, and Revenue-Cutter Service) whose duties are of an executive, supervisory, technical, or professional character, and whose compensation is \$2,000 or more per annum.

(b) Statistics relating to the Government service, to be prepared from the Civil Service Commission's card directory.

A bill substantially embodying this plan (except that \$1,500 was fixed as the lowest compensation of employees whose names should be included in the Official Register) was introduced in the House of Representatives on August 8, 1913, by Hon. W. C. Houston, of Tennessee.

Electrical industries.—The field work for the census of electrical industries has been finished. The examination of the returns is now in progress, and the tabulation has been begun. It is expected that the preliminary report will be ready for publication in February, 1914, and that the final report will be ready for the printer early in the following spring.

Cotton statistics.—While the collection of statistics of the quantity of cotton ginned from the crop of 1913 has proceeded in the same manner as heretofore, the Bureau has been able to arrange for the more frequent publication of these statistics by counties. It had been the practice to publish county figures only for December 13 of each year and at the end of the season, the State totals alone being given at other times. There was, however, a great demand for information as to the quantity of cotton ginned in the individual counties up to the date of each ginning report, and the Census Bureau accordingly gave the local special agents permission to publish this information in the county newspapers just as soon as their reports could be received at the Bureau in Washington and the data verified. The local papers throughout the Southern States have been greatly pleased by this action of the Census Bureau, and many of them have written the office expressing their appreciation of it.

Requests have been made of ginners for suggestions in regard to improving the method of collecting and publishing statistics of the quantity of cotton ginned, and almost invariably the replies have indicated complete satisfaction with the way in which the work is now being done.

The Bureau of the Census has also arranged for an additional report on cottonseed and linters, which will show the quantity of seed crushed and linters obtained from the crop prior to December 1

of each year. Heretofore there have been only two reports issued annually on this important subject, one showing the quantity of seed crushed prior to January 1 and the other, published at the end of the crushing season, showing statistics of the total quantity treated.

Tobacco statistics.—As already stated, three semiannual reports of the quantity of leaf tobacco on hand, relating to October 1, 1912, April 1, 1913, and October 1, 1913, respectively, have been made by the Bureau.

The Bureau of the Census has been able to make more satisfactory cooperative arrangements with the Bureau of Internal Revenue in connection with the collection of these statistics for the forthcoming report than it was able to make for either of the two preceding ones, so that it is now possible for the Bureau to secure, by correspondence with the collectors of internal revenue in the different districts, the names and addresses of the establishments covered by the law, together with all the information it requires in regard to delinquent establishments and establishments whose mail has been returned by the post offices as undelivered. This arrangement obviates the necessity of sending special agents into the field to secure the information, thus materially expediting the work and reducing its cost. The collectors have responded very promptly to the Bureau's requests for information of this character.

Financial Statistics of Cities.—In compliance with recommendation No. 6 of the expert special agents, the annual report on Financial Statistics of Cities for 1913 will be published in 1914 with somewhat less detail than has been included in many of the earlier reports, and will contain no text except such as is necessary for explanation and definition.

Vital statistics.—The Division of Vital Statistics, in accordance with recommendations Nos. 7 and 8 of the expert special agents, will publish the annual reports on Mortality Statistics for the years 1911 and 1912 before the close of 1913. In order to do this it will be necessary to omit certain rate tables and explanatory text, but the omission will be supplied in the report for 1913, which will be published considerably before the close of 1914.

Wealth, debt, and taxation.—The urgent deficiency act approved October 22, 1913, authorized the use of not to exceed \$50,000 of the unexpended balance for collecting statistics for the fiscal year 1913. This sum will be utilized in conducting the intercensal inquiry on wealth, debt, and taxation. So far as possible, the printed reports of the various State and other governmental units, and such other reports as may be available, will be used by the Census Bureau as sources of information. This will make it necessary in many cases to use data for the fiscal year 1912. The Bureau is now engaged in collecting all reports of this nature which can be secured without cost,

and has already accumulated a large amount of material. A critical study is being made of the data at hand, with a view to ascertaining just what can be done with printed and other available reports before sending employees into the field to make the actual canvass. The Post Office Department has been requested to cooperate with the Department of Commerce by directing postmasters in small towns, to which it would not be feasible to send agents of the Census Bureau, to furnish certain of the data needed. The scope of the report on this subject will be substantially the same as that of the preceding one, which related to the year 1902.

OFFICE FORCE.

Permanent employees.—The legislative, executive, and judicial appropriation act for the fiscal year 1913 provided for 610 permanent employees of the Census Bureau, or substantially the same number as had been authorized for the fiscal year 1909 (626), prior to the Thirteenth Census period. The distribution of the employees among the several salary classes in 1913 differed materially, however, from that which prevailed in 1909, the number of positions in the higher classes and in the \$900 class being increased and the number at \$1,200 being reduced.

The appropriation act for 1914 created seven additional positions at \$1,400 and five additional places at \$1,200 and reduced the number of \$900 positions by one, thus increasing by eleven the total number of places on the permanent roll of the Bureau.

The appropriation act for 1913 provided that the Civil Service Commission, in certifying eligibles from the examination registers for appointment to positions on the permanent roll of the Bureau during the fiscal year 1913, at salaries of \$1,200 or less, should, so far as practicable under the law of apportionment, give preference to those who had had at least one year's experience in census work. A statistical-clerk register was established by the Civil Service Commission for the special use of the Census Bureau. Prior to the establishment of this register appointments to the Bureau's permanent force were made principally from the departmental-clerk register, but later, after the statistical-clerk register had been established, most of the permanent appointments were made therefrom. The majority of the clerks drawn from these two registers had been temporary Thirteenth Census employees and were given preference in certification under the provision of law just mentioned.

Temporary force.—The appropriation act for 1913 authorized the employment of not to exceed 175 temporary clerks in the Census Bureau at salaries not to exceed \$900, and appropriated \$120,000 for that purpose. It was further provided that these clerks should be appointed from among the former temporary Thirteenth Census

employees. These 175 temporary clerks were appointed at \$720 per annum. Inasmuch as the appropriation act did not pass until August 23, it was not possible to appoint any of them before September 1, and many were not appointed until about October 1. Consequently, the appropriation of \$120,000 was considerably more than sufficient to compensate the 175 employees until the end of the fiscal year. The Bureau therefore asked for authority to increase the number of these employees without an increase in the amount of the appropriation. This authority was granted by the appropriation act for 1914, which was approved March 4, 1913. The temporary force was accordingly increased until it reached a maximum of 265 in May and June, 1913. On June 30, 1913, all these temporary positions lapsed under the terms of the act creating them.

APPROPRIATIONS AND EXPENDITURES.

*Financial statement, fiscal year 1913.***Administrative:**

Salaries for administrative places.....	\$36,179.15
Salaries for Division of Correspondence and Mail.....	20,026.50
Salaries for library.....	4,987.24
Salaries for watch, labor, and char forces.....	26,580.07
Rent.....	21,000.00
Stationery.....	9,869.20
Miscellaneous expenses.....	14,767.29
Books and periodicals.....	487.72

Total..... \$133,697.17

Geographer's Division: Salaries.....

19,740.28

Machine shop:

Salaries.....	23,246.00
Materials, supplies, etc.....	3,349.12

Total..... 26,595.12

Thirteenth Census work:**Population—**

Supervision.....	\$11,518.35
General and State reports.....	98,458.32
Occupations.....	177,985.88
Foreign born.....	445.12
Tenure of homes.....	16,133.59

Total..... 304,545.76

Agriculture—

Supervision.....	8,362.38
General and State reports.....	31,396.73
Color, tenure, and size.....	16,651.42
Plantations and ownership of tenant farms.....	14,913.17
Irrigation.....	2,831.20

Total..... 74,154.90

Manufactures—

Supervision.....	9,708.09
Completion of manufactures reports.....	41,819.74
Industrial districts.....	1,276.62
Mines and quarries.....	17,416.89

Total..... 70,222.24

Institutions.....

39,167.07

Revision and Results.....

24,319.79

Publications.....

11,333.21

Total..... 523,743.06

* Includes cost of supervision for forest products, cotton, tobacco, and electrical industries.

Annual investigations:

Cotton.....	\$253,291.44
Tobacco.....	25,508.76
Electrical industries.....	24,544.18
Forest products.....	19,045.37
Vital statistics.....	81,709.16
Statistics of cities.....	82,371.41

Total..... \$486,471.32

Miscellaneous..... 7,393.91

Grand total..... 1,197,840.81

Title of appropriation.	Appropriations.	Expenditures.	Balance.
Expenses of the Thirteenth Census, 1913.....	* \$102,339.30	\$99,998.68	\$2,340.62
Salaries, Bureau of the Census, 1913.....	* 593,823.28	574,250.58	19,572.70
Temporary clerks, Bureau of the Census, 1913.....	120,000.00	116,194.66	3,805.34
Tabulating machines, Bureau of the Census, 1913.....	† 26,643.93	26,595.12	48.81
Collecting statistics, Bureau of the Census, 1913.....	342,000.00	291,137.25	50,862.75
Tobacco statistics, Bureau of the Census, 1913.....	15,000.00	14,999.83	.17
Cotton statistics, Bureau of the Census, 1913.....	30,000.00	28,543.97	1,456.03
Rent, Bureau of the Census, 1913.....	22,080.00	21,000.00	1,080.00
Contingent expenses, Department of Commerce and Labor, 1913.....	25,500.00	25,120.72	379.28
Total.....	1,277,386.51	1,197,840.81	79,545.70

* Because of complications arising from the fact that the Bureau operated under joint resolutions of Congress from July 1 to Aug. 22, 1912, inclusive, the appropriation for "Salaries, Bureau of the Census, 1913," was divided by the Treasury Department into two parts—one, under the head "Expenses of the Thirteenth Census, 1913," amounting to \$102,339.30; and the other, under the original head of "Salaries, Bureau of the Census, 1913," amounting to \$593,823.28. The sum of these two items (\$696,162.58) is a little less than the amount originally appropriated (\$696,340).

† Includes \$643.93 reimbursement for work done for Bureau of Immigration.

Fiscal year 1914.—The appropriation for 1914 was \$1,122,820. The item for salaries was increased to \$711,240, the item for collecting statistics reduced to \$354,000 (as compared with \$387,000 in 1913, this amount including \$45,000 for collecting statistics of cotton and tobacco), and the item for tabulating machines reduced to \$10,000. No new appropriation was made for printing and binding the results of the Thirteenth Census, but the unexpended balance of the appropriation for 1913 was reappropriated and made available for 1914.

Fiscal year 1915.—The amount estimated for the fiscal year 1915 is \$1,709,720. The estimate for salaries has been increased to \$722,140, that for tabulating machines to \$15,000, and that for collecting statistics to \$925,000. The estimates for the other items are the same as the amounts appropriated for 1914.

In connection with the estimate for salaries, a reclassification has been asked for. The present and the proposed constitution of the office force of the Bureau (exclusive of special agents) are shown in the following statement:

PRESENT OFFICE FORCE.		OFFICE FORCE ACCORDING TO ESTIMATES FOR 1915.	
Director	\$6,000	Director	\$6,000
Chief clerk	2,500	Chief clerk	2,500
4 chief statisticians, at \$3,000 each	12,000	Chief statistician	3,250
Geographer	2,000	2 statisticians, at \$3,000 each	6,000
Stenographer	1,500	Statistician	2,750
8 expert chiefs of divisions, at \$2,000 each	16,000	2 assistant statisticians, at \$2,200 each *	4,400
11 clerks, at \$1,800 each	19,800	Geographer	2,000
20 clerks, at \$1,600 each	32,000	Stenographer	1,500
39 clerks, at \$1,400 each	54,600	8 expert chiefs of division, at \$2,000 each	16,000
305 clerks, at \$1,200 each	366,000	12 clerks, at \$1,800 each	21,600
83 clerks, at \$1,000 each	83,000	12 clerks, at \$1,680 each	20,160
86 clerks, at \$900 each	77,400	15 clerks, at \$1,560 each	23,400
Subclerical force	38,440	18 clerks, at \$1,440 each	25,920
Total	711,240	23 clerks, at \$1,380 each	31,740
		34 clerks, at \$1,320 each	44,880
		54 clerks, at \$1,260 each	68,040
		149 clerks, at \$1,200 each	178,800
		46 clerks, at \$1,140 each	52,440
		34 clerks, at \$1,080 each	36,720
		41 clerks, at \$1,020 each	41,820
		18 clerks, at \$960 each	17,280
		85 clerks, at \$900 each	76,500
		Subclerical force	38,440
		Total	722,140

* The two assistant statisticians at \$2,200 are in lieu of two office special agents at \$6 per day, whose compensation would be paid from the appropriation for collecting statistics. A corresponding reduction has been made in the estimate for this item, so that, while the increase in the estimate for salaries as compared with the appropriation for 1914 is \$10,900, the net increase in the estimate for compensation of office employees, including special agents, is only \$6,500.

The object of this proposed change is twofold—first, to provide a larger proportion of places in the higher salary classes; and, second, by increasing the number of salary classes, to make possible more frequent promotions.

The Bureau has at present an unduly large proportion of its employees in the \$1,200 class, although there has been a considerable improvement in this respect since the fiscal year 1909. The proposed reclassification, while calling for only a slight increase in the total appropriation for salaries, provides for a material increase in the number of higher-salaried positions. The estimate calls for 12 clerks at \$1,800 as compared with 11 at present; for 12 clerks at \$1,680 and 15 at \$1,560, or 27 at an average salary of about \$1,620, as compared with 20 at \$1,600 in the present classification; and for 18 at \$1,440, 23 at \$1,380, and 34 at \$1,320, or an aggregate of 75 at salaries ranging from \$80 below to \$40 above \$1,400, as compared with 39 at \$1,400 in the present classification.

Furthermore, as already stated, the proposed classification, if carried into effect, will, by providing so many more salary classes, make

possible more frequent promotions, with a resultant improvement in the esprit de corps.

The increase of \$5,000 in the estimate for tabulating machines is made because of the increase of work in the mechanical laboratory incident to the census of manufactures.

The large increase (\$571,000) in the estimate for collecting statistics is accounted for mainly by the item of \$566,400 for the quinquennial census of manufactures, which will relate to the calendar year 1914. The last previous census of manufactures, relating to the calendar year 1909, was taken at a cost for field work of \$517,044. The increase in the estimated cost is due largely to the fact that the census of 1909 was taken in connection with other field work, so that the cost of each branch was greatly reduced.

An item of \$18,000 is included for transcripts of birth records. No corresponding appropriation was made for 1914. Slight increases are made in the items for transcripts of death records and statistics of cities, and slight decreases appear in the items for cotton statistics and tobacco statistics.

A reduction of \$4,400 is made in the estimate for salaries of expert special agents to offset an item of that amount for salaries of two assistant statisticians (new positions) at \$2,200.

My report of the conditions in the Bureau of the Census would not be complete without making record here of the correspondence between the Director and myself regarding the safety of the records in that building.

Under date of September 27, 1913, the Director wrote me as follows:

There are in my custody in the Census building a number of volumes of the returns of the census from 1790 to 1900, which are of great value, and it would be impossible to replace them if they were destroyed. The names of the heads of families returned at the census of 1790 were considered of such great value that they were published, in order that they might be placed on record in different libraries and render it impossible for all to be destroyed. These returns, however, are incomplete, as we have no returns for the State of Delaware for 1790; none for the State of Georgia for 1790, 1800, and 1810; Kentucky is missing for 1790 and 1800; New Jersey from 1790 to and including 1820; Tennessee from 1790 to and including 1810, and Virginia for 1790 and 1800. A number of the missing returns referred to were destroyed when the Capitol was burned by the British, and the others from fires in the Patent Office.

In addition to the records of population, we have the following-named bound volumes:

Subject.	Number of volumes.
Agriculture.....	644
Mortality.....	131
Social statistics.....	43
Industries.....	197
Defectives.....	68
Total.....	1,083

The total number of volumes from 1790 to 1880 comprised 4,622. In 1890, when the schedules were not bound, we had approximately 44,000 bundles of schedules. For 1900 we have 2,812 volumes. The population returns for 1910 are in a fireproof vault and fill it completely. They have not been bound and are constantly referred to. The census returns from 1790 to and including 1900 are continually referred to for genealogical purposes, and the returns for 1850 and 1860 are constantly being examined to secure data showing the ages of pensioners, as they are unable to obtain any other record evidence of their ages. These volumes, especially, are proving invaluable and could not, of course, be replaced if they were destroyed, and as time passes by the census returns will prove of greater value, as it is the only list to which individuals can refer in order to establish relationship in their families, often required in settling estates.

In addition to the census returns, we have many division records, the loss of which would cause great embarrassment and thousands of dollars would have to be expended to attempt to replace them. For instance, the Geographer's Division has the plans of division into enumeration districts, into which the country was divided in 1910. These official records, if lost, could not be replaced and would involve great expense in the preparation for the Fourteenth Census. There are in all the divisions of the Census Bureau division records that are essential in preparing for another census, and they would all be lost if there was a fire which destroyed the present building occupied by the Census Bureau. As a precautionary measure, I have had the chief clerk post "No smoking" placards throughout the building and have issued an order positively prohibiting smoking in any part of the present building. While orders against smoking were previously issued by my predecessors, I have been informed that no action was taken to enforce them in toilet rooms and among the higher officials. It will probably be necessary for me to take drastic action in some case in order to show, by example, that there must be no smoking in the present Census building.

The necessity for a fireproof vault to inclose these records has been conceded at every enumeration, and when the present Census building was built a vault was placed therein, which was large enough to hold all the returns of population from 1790 to 1900, except the schedules for 1890. This vault now contains only the unbound population schedules for 1910. The bound volumes containing the returns of the other censuses, except 1890, have been placed on metallic shelves in the northern part of the large east room. The census schedules from 1790 to 1900, except those of 1890, now occupy in the Census Bureau a space 45 by 26 feet, 12 feet high. The population returns for the census of 1890 require about as much space as the returns for the other enumerations; that is, if

we attempted to place the returns in a vault, it would have to have approximately 2,340 square feet for cases at least 12 feet high.

To this I replied on October 3, as follows:

Referring to your communication of the 27th on conditions as regards the fire risk to valuable records in the building at present occupied by your Bureau, let me say that your instructions prohibiting smoking are approved, as is also your intention to enforce them strictly. Kindly give consideration to any other precautions that may further provide safety, such as absolute cleanliness in out-of-the-way places, supervision of the night watchmen, provision of fire-extinguishing appliances readily accessible, arrangements for the prompt removal of the more valuable part of the records in case of fire. In short, take whatever steps your judgment suggests and the means at your disposal permit to prevent loss.

Take a note to bring the matter again to my attention the latter part of November that I may bring the subject before both Houses of Congress in the hope that they may provide funds which will permit our putting these invaluable records into a condition of safety. In the meantime I suggest your sending a copy of your letter to me and of this, my reply, to the Chairmen of the House Committee on the Census and the Senate Committee on the Census, in order that they may be fully informed.

BUREAU OF FISHERIES.

FISH-CULTURAL WORK.

Although there were no material changes in the methods pursued, and the appropriation for the propagation of food fishes was the same as in the preceding year, the output of fish and eggs during the fiscal year 1913 was the largest in the Bureau's history. This was due to an improvement in the efficiency of the personnel and to the extension of the work into new productive fields by the operation of inexpensive auxiliary stations at well-selected points.

The total output of the hatcheries was 3,863,593,000, of which 3,421,591,000 were fry, 19,726,000 were fingerlings, yearlings, and adults, and 422,276,000 were eggs, most of the latter being furnished to States for hatching and planting within their own borders under the direction of local fishery authorities. Thirty-four permanent or main hatcheries and 102 substations and egg-collecting stations were operated during the year in 30 States and the Territory of Alaska. Two additional stations are in course of construction. The lobster and 39 species of fish were propagated, of which 12 species were handled in excess of 50 million each, yet despite the variety and the enormous and increasing scope of the operations it is impossible to satisfy the demand for fish to stock public and private waters.

As compared with the preceding year there were conspicuous increases in the hatch of chinook, silver, and dog salmon. The conditions on the Sacramento River and its tributaries and at other places in California, low water during part of the season and freshets later, reduced the collections of eggs of the chinook and silver salmon in that State, but this was more than compensated for by the favorable climatic conditions on the Columbia River and at other places in Oregon. The two Columbia River hatcheries were taxed to their utmost capacity and eggs were still available when all facilities for handling them were exhausted. At Baker Lake and auxiliary stations in Washington the output of chinook, blueback, silver, and dog salmon and steelhead trout was about double that of the preceding year, and at the Puget Sound stations a slight falling off, due to the destruction of retaining racks by freshets, was more than offset by collections at several new field stations.

The operations of Afognak station, Alaska, were seriously interfered with by the eruption of Katmai Volcano on June 6, 1912, which

covered the island with ash and sand to an average depth of 9 inches. It is estimated that 20,000 adult salmon were killed at the head of Litnik Lake, while thousands more were driven from the streams during the spawning season. Not only were the conditions such as to militate against the collection of eggs, but heavy losses were sustained among the comparatively few collected, owing to the accumulation of volcanic ash in the hatching troughs. Toward the end of the year temporary field stations were established to test the conditions for egg collecting at Eagle Harbor and Eganak Lake, on Kodiak Island.

The facilities at Yes Bay station, Alaska, were improved and augmented during the year, but the take of blueback-salmon eggs was 8 or 9 per cent below that of the preceding year, owing to low water, followed by heavy freshets which destroyed the racks and liberated several thousand ripe fish.

Despite the magnitude of the fish-cultural operations on the Pacific coast, the intensity of the salmon fishery is such that in many places there is a distinct falling off in the run. There is no doubt that part of this decrease is occasioned by defective State administration and legislation, but in a further attempt to overcome the retrograde tendency of the catch it is the purpose of the Bureau to so modify its methods in respect to the salmons as to rear a larger proportion of them before they are planted. It is believed also that the basis of cooperation with the States may be changed for the better.

The take of shad eggs at the stations in the Chesapeake Basin was less than 40 per cent of that of the preceding year, and there is no doubt that this is in large part due to the character of the fishery in the bay and its tributary streams. The number of the pound nets is excessive and they are set in strings which extend miles from shore and, together with the anchored gill nets, effectively obstruct the passage of the fish to their spawning grounds in the rivers. The conditions are similar to those formerly obtaining in Albemarle Sound and the upper part of Pamlico Sound, N. C., but which the enlightened policy of the State has corrected. As the result of the maintenance of a continuous open passage from the sea to the rivers, the catch of shad in North Carolina during the past season was as great as or greater than in any other year of the history of the fishery, and the take of eggs at Edenton station, N. C., reached 138 million, compared with the low-water mark of 6 million the year before remedial legislation was enacted. The fishing industry and the fish-food supply of the Virginia rivers are seriously menaced unless prompt and effective steps are taken to improve existing conditions. A conference of the authorities of Virginia and Maryland with officers of the Bureau of Fisheries has been held, from which it is hoped effective results may spring.

On the Great Lakes and other waters near the Canadian boundary the results of operations were various. The take of lake-trout eggs on Lake Superior, owing to storms, was below expectation in both quantity and quality, and on Lakes Huron and Michigan it was interfered with by the lateness of the season, which brought the climax of the spawning into the close time when no eggs could be obtained. While storms interfered with the whitefish work at the Michigan stations, Put-in Bay station, on Lake Erie, had the most successful season in its history so far as this species was concerned. On the contrary, the pike-perch work on Lakes Huron and St. Clair was vastly more successful than in the preceding year, while on Lake Erie storms and flood water rendered it very disappointing. On Lake Champlain the take of pike-perch eggs was comparatively small and would probably have been an almost complete failure had it not been for the establishment of a collecting station and fish pen at Sandy Point, a step which will probably insure greater efficiency in the future.

Lobster culture was conducted at but two stations (Boothbay Harbor, Me., and Gloucester, Mass.), nothing being done with this species at Woods Hole, as the number of available brood lobsters on the Massachusetts coast was insufficient to warrant the operation of two hatcheries in that State. The stock of brood lobsters at Boothbay Harbor was the largest ever secured, but the average size was smaller and an unusual number dropped their eggs in the pound, so that the take of eggs was smaller than in the preceding year. The spring collection of brood lobsters at Gloucester was the poorest for many years. During the spring 106 lobsters, with eggs attached, were liberated off Cape May, N. J., in an attempt to establish the lobster more abundantly in that vicinity.

Flatfish were unusually scarce at Boothbay Harbor during the spawning season, but the loss in incubation was unusually low, and 413,961,000 fry were hatched. At Gloucester 230,070,000 were hatched and distributed, about two-thirds as many as in the preceding year, the falling off being due to the extraordinary crowding of the hatchery with other species. At Woods Hole the supply of brood fish was abundant, but the eggs were of indifferent quality and the mortality was high. Cod were not as abundant as usual at Boothbay Harbor, but great numbers were hatched at Gloucester and Woods Hole. Haddock were taken in large numbers in the vicinity of Boothbay in April and about 100 million eggs were secured for the station. The take of eggs at Gloucester was also unusually heavy and, with the other species handled there, taxed the facilities of the station to such an extent that in addition to shipments to Woods Hole nearly 200 millions of partly incubated pollock, cod, and haddock eggs

were planted off the harbor. On the whole, the work of the marine stations was highly productive.

At the fresh-water stations of the Bureau the conditions were generally satisfactory, but the product of the pond stations devoted to the propagation of black bass and related species, though greater than ever, was as usual wholly unequal to the demand. An increase in the facilities for this branch of the work is urgently needed and it is hoped that requirements will be to some extent satisfied by the stations now under construction in Kentucky and South Carolina. It is probable, however, that black bass can not be supplied in quantities equal to the demand for some time to come.

At some of the trout stations it has been found economical to supplement the supply of brook-trout eggs derived from the brood fish carried in ponds and collected from wild stock by purchase from commercial hatcheries, and the total output of the species has been increased, while, owing to unfavorable climatic conditions, the product of rainbow trout fell off during the year.

In the Yellowstone National Park the provision of additional facilities and the extension of the field of operations resulted in the collection of 29 million blackspotted-trout eggs, more than double the number secured in any previous year. Plans will be made to further increase the work in this field, at present the chief source of the Bureau's supply of eggs of this species.

Owing to high water it was not possible to secure eggs of the steelhead trout from the tributaries of Lake Superior, but 50,000 eggs were transferred from the Pacific coast to Duluth and after hatching were planted in these streams. About 176,000 eggs were obtained from Lake Memphremagog, where the Bureau has introduced this species, and were hatched at St. Johnsbury, a new departure in fish culture at that station. The steelhead, which is a western species, is becoming important in the eastern waters in which it has been introduced, not only as a game fish but as a valuable and growing factor in the commercial fisheries.

The rescue of fishes left by the recession of overflow waters in the Mississippi Valley was prosecuted with varying success. These fishes (black bass, crappie, sunfish, catfishes, and other river species) are taken from the sloughs where otherwise they would die, and are either returned to the main streams or used for stocking other inland waters.

The Bureau regards as one great object of its activities the ability to supply in large numbers a fish suitable for the shallow, warm-water ponds and streams of the western farming country, and to this end it is experimenting with the propagation of the buffalofish, though as yet with indifferent success.

INVESTIGATIONS AND SURVEYS.

At the request of the State authorities a survey of the oyster bottoms of Lavaca Bay, Tex., was begun by the steamer *Fish Hawk* early in February, 1913, and continued until completed in May. At the end of the fiscal year the plotting and computations had been finished and the report will be completed during the current year. Investigations of enemies of the oyster have been made as opportunity has been afforded, but the lack of continuity in this work caused by the insufficient personnel has prevented rapid progress. The Bureau has repeatedly urged that additional assistants be provided for work in connection with shellfishes, but although the oyster interests of all parts of the country are asking for aid the appeal has been thus far unheeded by Congress. The oyster, clam, and crab fisheries yield a first product valued at about \$17,000,000, yet they receive less consideration at the hands of the Government than is given to stocking for purposes of sport the minor waters of a single State.

Mussel propagation in the Mississippi Valley assumed during the year proportions which warrant expectation of commercial results, 150 million larval mussels being planted in 15 localities. The most extensive work was at Lake Pepin, Minn., and in the vicinity of Fairport, Iowa, but plants of consequence were made at other places in Minnesota and Iowa and in Wisconsin, Illinois, Indiana, and Arkansas. As a necessary part of these operations about 100,000 food and game fishes were handled, of which a large number were rescued from overflowed lands and returned to the rivers. Laboratory and field investigations have opened up sources of information which will make it possible to propagate a larger quantity and greater variety of mussels during the ensuing year.

Field operations were curtailed by the delay of appropriations early in the year, but examinations were made of the mussel resources of several localities, one of which opened up a possible new source of supply of commercial shells.

The investigation of the Illinois River in respect to the effects of the discharge of sewage from the Chicago Drainage Canal was completed. The report, which is ready for publication, furnishes valuable data on the general subject of the pollution of streams.

The waters of the Truckee River Basin were under investigation at various times during the year. As has been indicated in previous reports of the Bureau, the use of the waters of this region for irrigation purposes has already reached a stage resulting in the destruction of large numbers of valuable food fishes. It appears inevitable that with the growth of the area irrigated the streams eventually will be reduced in places to practically dry beds at certain seasons, and the native fishes will become a negligible factor in the

food supply. It is possible that a way may be found to compensate for this deficiency by introducing other species of nonmigratory habit which can be acclimatized to the permanent waters, but it is becoming yearly more evident that it will be necessary in some cases to make a frank recognition of the fact that more and cheaper food can be produced in arid regions by the irrigation of the land than by the conservation of the fishes in the streams. It is the purpose of the present investigation to determine whether it is possible to develop the one source of food supply while maintaining the other.

During the summer of 1912 the Bureau continued its examinations of lakes in Washington and Idaho to determine their physical and biological characteristics, particularly as they may affect the culture and acclimatization of fishes. It frequently happens that disappointing results follow the planting of fish in lakes which superficially appear to be admirably adapted to the purpose, and recent investigations have shown that the failures are often due to the physical conditions of the deeper waters.

During July and August, 1912, the schooner *Grampus* was employed in an investigation of the oceanography of the Gulf of Maine, with the purpose of determining the physical and biological conditions governing the distribution of fish food and young fishes. The work was supplemented during the winter and spring by observations off the coast in the vicinity of Gloucester and on Georges Banks in connection with the trawl investigations.

Terrapin culture at Beaufort reached a stage which justified the Bureau in issuing a circular descriptive of its methods and commending it as promising financial returns to persons undertaking it on a business scale. Considerable interest has been manifested in the project, and commercial experiments are being conducted under private auspices in North Carolina and Florida.

During the year considerable progress has been made in the accumulation of material toward a series of publications on the life histories of important food fishes and other valuable aquatic animals. This necessarily is slow work, as much of the data is collected in connection with other investigations.

The marine laboratories at Woods Hole, Mass., and Beaufort, N. C., were opened at the beginning of the fiscal year, but were operated with considerable embarrassment, owing to the inadequacy of the appropriations made available pending the passage of the sundry civil bill. The months of June, July, August, and the first half of September comprise the period of greatest activity in scientific field and laboratory work, owing not only to the clemency of the weather and the greater opportunities afforded for study but also to the availability at that time of a considerable number of qualified investigators who are occupied in university work at other seasons.

At the close of the year the permanent laboratory at Fairport station was ready for occupancy. This station, which combines facilities for fish culture, mussel culture, practical shell testing, and biological and chemical investigations and experiments, is designed as a center of a large part of the Bureau's activities in the Mississippi Valley.

COMMERCIAL FISHERIES.

Oyster industry.—The canvass of the oyster industry which was begun in 1910 was concluded during the year by the completion of the statistics of Maryland and Virginia and the States of the Pacific coast. Maryland ranks first in the number of persons engaged in the industry, which in 1912 was 24,287, who received \$2,724,641 in wages. The yield of oysters was 5,510,421 bushels. But 280,010 bushels, valued at \$149,069, came from planted grounds, the recent legislation for the encouragement of oyster culture not having been operative for a sufficient period to have its effects shown in the yield. The application for leases under this law encourages the belief that the State may before long regain her proper place as an oyster producer. Her status, so far as the employment of labor is concerned, is conditioned by the magnitude of her wholesale trade, which was valued at \$4,640,173, and the use of hand apparatus only in taking oysters.

Virginia in 1912 had 16,487 persons engaged in the industry and the wages paid amounted to \$2,112,170; 6,206,098 bushels of oysters were produced, and 36 per cent of the quantity and 50 per cent of the value were yielded by the planted beds. The wholesale trade of the State was valued at \$2,653,590.

On the Pacific coast the industry appears to be in a depressed condition, and there has been a heavy decrease in both the quantity and quality of the product during the past 10 years. In California the entire product is derived from planted beds, and in 1912 it comprised 68,037 bushels, valued at \$280,344, of which all but 600 bushels were eastern oysters grown from seed or young transplanted from the Atlantic coast. There is also a growing trade in eastern oysters brought into the State for direct consumption. In Oregon the oyster fishery is negligible, but in Washington in 1912 it produced 142,329 bushels, valued at \$386,849. Of these all but 55,736 bushels of native seed oysters, valued at \$14,813, were grown on private beds, and most of the value was contributed by the native oyster.

With the completion of these canvasses it is possible to furnish statistics of the oyster industry as a whole by combining the sectional data for the different years. The total number of persons engaged in the oyster industry of the entire United States was 67,257, with yearly wages amounting to \$10,876,801, and the capital invested, excluding the value of the private beds, was \$16,880,032. The yield

of oysters was 32,988,815 bushels, valued at \$15,377,983, about 46 per cent of the quantity and 65 per cent of the value being the product of private planted beds. In the New England States 93 per cent, in New York 86 per cent, and on the Pacific coast 73 per cent of the product are derived from planted beds, and the relative value of the oysters per bushel increases with the increased importance of planting.

Virginia produces more oysters than any other State, but New York, most of whose natural beds are practically extinct, ranks first in value of its product. Maryland, which has the greatest area of natural beds, occupies second place as to quantity and third as to value, her position being due to the practical nonexistence as yet of oyster culture within her borders.

New England vessel fisheries.—The usual statistics of the vessel fisheries on the high seas conducted out of Boston and Gloucester, Mass., were collated and published as timely monthly and annual bulletins. In 1912 there were landed at Boston 3,676 fares of fish, aggregating 100,300,080 pounds and valued at \$2,731,391, and at Gloucester 3,973 fares, weighing 82,403,979 pounds and valued at \$2,047,868. The receipts at Boston were all fresh fish, with the exception of 143,000 pounds of salt mackerel, valued at \$9,442, and those at Gloucester consisted of 51,263,695 pounds of fresh fish, with a value of \$1,055,295, and 31,140,284 pounds of salted fish, valued at \$992,573. The total receipts at both ports were 7,649 fares, of 182,704,059 pounds, valued at \$4,779,259. Compared with 1911 there was an increase of 849 fares, but a decrease of 2,449,308 pounds in the quantity and \$245,238 in the value of the catch. Sixty-eight per cent of the quantity and 64 per cent of the value yielded by the vessel fisheries of the two ports were from the fishing grounds adjacent to the coast of the United States; 12 per cent each of the quantity and value were derived from grounds off Newfoundland; 20 per cent of the weight and 23 per cent of the value were yielded by the grounds off the Canadian Provinces, and less than 1 per cent of the quantity and a little over 1 per cent of the value resulted from the fishery on the coasts of Greenland and Labrador.

There were produced 53,705,128 pounds of cod, valued at \$1,674,033; 63,547,230 pounds of haddock, valued at \$1,337,326; 15,889,952 pounds of herring, valued at \$353,032; 3,541,539 pounds of halibut, valued at \$347,250; 4,208,240 pounds of mackerel, valued at \$268,338; 15,558,431 pounds of hake, valued at \$255,053, and 14,666,662 pounds of pollock, valued at \$243,126. The remainder consisted of cusk, swordfish, and miscellaneous species.

The product of the mackerel fishery in 1912 was 31,861 barrels fresh and 8,267 barrels salted, against 43,541 and 6,633 barrels, respectively, in the previous year. The quantity landed at Boston

was 2,496,620 pounds of fresh fish, valued at \$148,496, and 143,000 pounds salted, valued at \$9,442, and at Gloucester 163,620 pounds fresh and 1,405,000 pounds salted, the values being \$9,390 and \$101,010, respectively. In 1913 the catch of fresh mackerel to July 1 was 22,837 barrels, about double that of the preceding year, and 1,523 barrels of salt mackerel were taken to that date. Mackerel were scarce on the southern grounds in the spring, but the fishery on the Cape shore was successful, notwithstanding that the fleet was late in arriving on the grounds.

The herring fishery on the Newfoundland shore in 1912-13 was prosecuted by 42 vessels, of which 6 made two trips. The fish were obtained at Bay of Islands and Bonne Bay and consisted of 47,184 barrels salted and 10,609 barrels frozen, a total of 13,163,776 pounds.

The otter-trawl fishery out of Boston, which is conducted by a single company, has been under investigation by the Bureau in consequence of the opposition which it has excited among the line-trawl fishermen and others interested in the fisheries, and the information acquired will be the subject of a special report. The fishery during the fiscal year employed regularly 6 steamers and occasionally 7. Since July 1, 1913, three new steamers have been added to the fleet. During the calendar year 1912 these vessels landed at Boston over 16,000,000 pounds of fish, of which 14,000,000 pounds were haddock. The fishery is confined chiefly to Georges Bank and adjacent grounds, but in March, 1913, for the first time since the inception of the fishery, it was necessary to resort elsewhere, owing to the scarcity of fish, and several trips were made to Western Bank.

About 1910 an innovation was introduced in the Gloucester, Mass., fisheries by employing for the capture of haddock, cod, and pollock the type of vessels and gill nets employed on the Great Lakes. The results were satisfactory, and in 1911 about 20 vessels were employed; in the fiscal year 1913 the fleet had increased to 38 vessels. The nets differ in details from those formerly, and to some extent at present, employed in the cod fishery, and instead of being fished from dories are set and hauled by the vessels, which are driven by gasoline or other engines, thus permitting the fishing of strings averaging in length between $2\frac{1}{2}$ and 3 miles. The fishery of late has been carried on principally on banks between 8 and 12 miles from shore, although in preceding years it was prosecuted nearer the coast.

Pacific coast fisheries.—The salmon fisheries of the Pacific coast were prosperous in 1912, but the pack as a whole, notwithstanding an increase in Alaska, fell short of that of the preceding year. The purse-seine salmon fishery in the Puget Sound region employed 170 boats, compared with 136 in the preceding year. The halibut catch was approximately 35,000,000 pounds, about the same as in the preceding year, but it was marketed at higher prices. The cod fishery

was carried on by 7 firms, employing 13 vessels, of which 8 sailed from San Francisco and 5 from Puget Sound ports. The catch for the year was about 9,300,000 pounds.

ALASKA FISHERIES AND FUR RESOURCES.

Owing to the season at which the fisheries of Alaska are conducted and the difficulty of communication, complete returns are not obtainable until late in the fall and it is necessary, therefore, to present data for the calendar year 1912 and not for the fiscal year ended June 30, 1913.

Alaska Salmon Service.—There has been the usual inspection of fishing grounds, apparatus, and methods, and so far as could be determined by the field agents of the Bureau the fishery laws and regulations have been generally well received and respected, although the territory is so vast, communication so difficult, and the agents so few that many regions were not visited.

Under authority of the order of the Secretary, dated March 21, 1912, permitting restricted fishing in reserved waters by natives of Afognak Reservation, 93 permits were issued. The eruption of Katmai Volcano, to which reference has already been made, interfered with the fishery, and but 175,000 salmon were taken, including 17,000 handled at the hatchery.

There was an unusually heavy run of salmon on the south side of Bristol Bay, and the pack was 40 per cent greater than in 1911. In central Alaska and Bering Sea the run of humpback salmon was large, but there was a falling off in southeast Alaska. In the latter locality the run of red salmon was about normal, but in the Nushagak region and in central Alaska there was a shortage, resulting in an increased pack of inferior species; 16,963,000 more salmon were caught in 1912 than in 1911 and the value of the product increased more than \$2,000,000. The total catch of salmon was 60,938,945, from which were prepared 4,056,021 cases of canned fish, valued at \$16,295,490, in addition to minor products to the value of \$837,652. The canneries numbered 87, compared with 64 in the preceding year.

In 1912 the Government and private hatcheries took 167,109,470 red-salmon eggs, a decrease of 102,557,330 (most of it in the private hatcheries) compared with 1911. Under the provision of law exempting from taxation the output of salmon canneries which maintain hatcheries, at the rate of 10 cases of salmon for each 1,000 red or king salmon fry liberated, the tax rebates allowed amounted to \$61,744.

The salmon ascending Wood River to spawn were again counted, the results, compared with those of 1908, showing a serious condition, the catch in the Nushagak region during the five-year interval

having decreased 37 per cent, while the number escaping to the spawning beds fell off 87 per cent.

Other fisheries and their development.—The usual statistical canvass of the Alaska fisheries as a whole showed that 24,263 persons were engaged, the investment was \$38,263,457, and the products were valued at \$18,877,480.

There is a growing appreciation of the value of marine products formerly regarded as useless, and a number of small plants have been established to utilize them. As yet, however, but a small part of the available aquatic plants and animals have been used, notwithstanding that many of them possess high economic value. Their qualities are unknown to the public, methods of preparation are yet to be developed, and markets for them remain to be established. That these potential resources may be made known and developed it is urgently needed that there be established on the Alaska coast a properly equipped station for purposes of experiment and investigation.

Fur-Seal Service.—The treaty making pelagic sealing unlawful went into effect December 15, 1911, and the season of 1912 was the first for many years in which the seal herd has not been subject to the ravages of pelagic sealers. It is estimated that this resulted in the increase of the herd by about 30,000 seals above the number which would have been on the islands had the destruction at sea continued. A census of the herd made in 1912, under conditions which for the first time permitted an actual count of the majority of the animals, showed that there were about 215,940 seals of all classes. A census made in the summer of 1913 after the close of the fiscal year showed 268,305 seals of all classes.*

I have limited to 3,000 the number of seals to be killed during the calendar year 1913 for the food of the natives on the Pribilof Islands. It is probable that a smaller number will suffice.

The sealing operations on the Pribilof Islands during the season of 1912 were again under the direct control of the Bureau's agents. There were sold at auction in London, January 17, 1913, by Messrs. C. M. Lampson & Co., as agents for the Government, 2,880 skins from St. Paul Island and 884 from St. George Island, together with 9 of the previous season which had been sent to Washington for experiment, a total of 3,773 skins. The net proceeds which were covered into the Treasury were \$130,640.57. Under the leasing system in force prior to 1910 the Government would have received but \$38,589.25 for these skins.

Minor fur-bearing animals.—The take of fox pelts on the Pribilof Islands during the winter of 1911-12 consisted of 384 blue and 29

* The Department is informed that a separate census, taken during the summer of 1913 by representatives of the Committee on Expenditures in the Department of Commerce of the House of Representatives, sent to the Pribilof Islands for that purpose, showed 190,950 seals of all kinds.

white skins, which were sold on behalf of the Government, in London, March 7, 1913, for \$20,505.17, after the deduction of commissions and other charges. One choice lot of 28 skins from St. Paul Island sold for \$131 each. Under the leasing system the Government received nothing for fox skins.

A warden and four deputy wardens established headquarters in the more important fur-producing regions of the mainland of Alaska and were thus not only able to enforce the regulations but to secure specimens and much information relating to the habits of the fur-bearing animals, valuable in bringing the regulations into stricter accord with requirements. These studies resulted in a revision of the regulations, approved by the Department March 26, 1913, the principal changes being (1) the extension of the close season on beavers to November 1, 1918; (2) minor changes in the close seasons for several other fur bearers; (3) the removal of the close season on the black bear, and (4) prohibition of taking or selling unprime skins.

The cooperation established with the governor of Alaska, whereby five of the Alaska game wardens have been appointed special fur wardens in return for the aid rendered by the Bureau's wardens in enforcing the game laws, has continued to operate satisfactorily and for the improvement of the protection accorded fur-bearing animals.

In the early part of 1913 it became impracticable for the governor of Alaska to continue the Bureau's agents as game wardens, but certain of the Territorial wardens continue to enforce the fur laws under an arrangement by which they receive a nominal salary of \$10 per month. During the year three convictions were obtained, but the regulations are generally observed and have already caused an improvement in the quality of the skins shipped from Alaska.

A number of permits have been issued authorizing the taking and shipping of various fur-bearing animals, principally foxes, for breeding purposes. Applications for permits for such operations became so frequent as to cause concern in regard to the maintenance of the natural supply of wild stock. The Department decided to issue further permits for the shipment of foxes from Alaska only to bona fide owners or operators of fox ranches and to make such permits applicable only to foxes which had been bred and reared on those ranches. It was also decided to discontinue the issuance of permits authorizing the capture in Alaska of any fur-bearing animal during the close season prescribed for the species concerned. I have also determined to lease for fox raising, to the highest responsible bidders, certain islands in Alaska, and further to encourage the industry, the Department will furnish, under competitive bids, a limited number of breeding foxes from the Government herds on the Pribilof Islands.

MISCELLANEOUS ACTIVITIES AND RELATIONS OF THE BUREAU.

The Bureau has continued its cooperation with the Department of Agriculture in identifying and examining samples of foreign and domestic fishery products and in other ways furnishing information and advice to the food and drugs board.

During the year 5,610,000 eggs were shipped to foreign countries in response to official requests. Of these 5,000,000 were whitefish sent to British Columbia, 150,000 brook trout and 100,000 steel-head trout to Canada, and the remainder were rainbow trout shipped to Germany, India, and Japan.

A fisheries intelligence service was established at Seattle, Wash., during the year, but owing to the difficulty in securing a competent local agent it has not been as useful as was anticipated.

During the year sworn admissions of breach of the act of June 20, 1906, for the protection of the sponge fisheries were obtained from the masters of a number of sponge diving vessels, who were held for trial and the vessels libeled. They entered bond and were released, and immediately proceeded to the sponge grounds and repeated the offense. The cases have not yet come to trial and the terms of the law are such that no further arrests or seizures can be made unless the offenders again furnish evidence against themselves. As previously recommended, the act should be either amended or repealed, as in its present unenforceable terms it fosters contempt for the law.

In view of the conditions mentioned in the preceding paragraph the Bureau, on request, prepared a bill designed to correct the defects of the present law. This bill was introduced in the Senate and passed early in the fiscal year. When it reached the House, however, opposition to some of its features developed among those interested in the sponge industry and a hearing was held before the Committee on Merchant Marine and Fisheries. No action has been taken by that committee.

Bills providing for the establishment of fish-cultural stations in many parts of the country were introduced in Congress and considered in committee. One in Utah and one in Rhode Island were acted on favorably, and \$25,000 was appropriated toward the construction of each.

An act to give effect to the convention between the Governments of the United States, Great Britain, Japan, and Russia for preservation and protection of the fur seals and sea otter which frequent the waters of the North Pacific Ocean, concluded in Washington, July 7, 1911, passed Congress and was approved August 24, 1912. By this act all killing of fur seals on the Pribilof Islands (except for food of natives) is suspended for a period of five years.

The act to create a legislative assembly in the Territory of Alaska, approved August 24, 1912, particularly excepted authority for the legislature of Alaska to alter, amend, modify, or repeal any laws of the United States applicable to Alaska relative to fish, game, fur seal, or fur-bearing animals.

The Bureau participated in the work of the Permanent International Council for the Exploration of the Sea, and was represented at the annual meeting of the council at Copenhagen in September, 1912. Plans have been made for cooperative investigations of the North Atlantic Ocean in the interests of the fishing industry of both Europe and America.

BUREAU OF LIGHTHOUSES.

ORGANIZATION.

The United States Lighthouse Service is charged with the establishment and maintenance of aids to navigation, and with all equipment and work incident thereto, on the sea and lake coasts of the United States, on the rivers of the United States, and on the coasts of all other territory under the jurisdiction of the United States with the exception of the Philippine Islands and Panama. The jurisdiction of the Lighthouse Service over rivers not included in tidewater navigation is restricted to such as are specifically authorized by law; these now include practically all the important navigable rivers and lakes of the country.

All the work of establishing and maintaining the aids to navigation under the jurisdiction of the Lighthouse Service is performed directly by the Service through the district organizations, with the exception of a few minor aids which are maintained by contract and with the exception of the American Samoan Islands and Guantanamo Bay, Cuba, where the aids are maintained through the local authorities. The Lighthouse Service also has supervision over the establishment and maintenance of private aids to navigation.

The office in Washington, which is the executive center of the Service, is under the Commissioner of Lighthouses and the Deputy Commissioner. There are in this office an engineering construction division, under the Chief Constructing Engineer; a naval construction division, under the Superintendent of Naval Construction; a hydrographic division, under an assistant engineer, and the general office force, under the chief clerk.

The Service outside of Washington is divided into 19 lighthouse districts, each of which is under the charge of a lighthouse inspector. In each district there is a central office at a location selected on account of either its maritime importance or its geographical position, and there are also one or more lighthouse depots located conveniently for carrying on the work of the district in the matter of storing and distributing supplies and apparatus. Each district is provided with one or more lighthouse tenders for the purpose of distributing supplies to the various stations and light vessels and for transporting materials for construction or repair, for the placing and care of the buoyage system in the district, and for transporting the

inspector and other officers of the Service on official inspections of stations and vessels and on other official duty.

In addition to the several district depots, there is in the third lighthouse district, on Staten Island, New York Harbor, a general lighthouse depot, where many of the supplies for the whole Service are purchased and stored and sent out for distribution, where much of the special apparatus of the Service is manufactured or repaired, and where also there is carried on various technical work in the way of testing apparatus and supplies and designing or improving apparatus.

On June 30, 1913, there were 5,536 persons employed in the Lighthouse Service, including 86 in the technical force, 146 in the clerical and office force, and 5,304 employees connected with depots, lighthouses, and vessels.

ADMINISTRATION METHODS AND ECONOMIES.

During the year systematic inspections have been continued in the various lighthouse districts by the general inspector as respects the technical work and vessels and by the examiner as to business methods, property accounts, and clerical organization. The effects of this work have been of great value in maintaining the vessels and other equipment of the Service to a proper standard, systematizing methods in the district organizations, auditing district property accounts, and examining records.

The standard method of cost keeping has been continued throughout the year, and reports have been received which indicate itemized costs of various depots or aids to navigation, as well as office and other overhead expenses. This information will continue to be of increasing value as it is compiled from year to year.

Further improvements have been made in the publication of light and buoy lists during the year, the light lists being designed for the general use of navigators and the buoy lists being for local and service use.

A special disbursing agent has been appointed in each lighthouse district in order to insure expeditious payment to creditors of the Service, with satisfactory results.

Under authority of the act of June 27, 1912, an arrangement was made with the Navy Department for the purchase of crews' uniform clothing from naval stores by this Department, to be sold to the employees of the Lighthouse Service, and the appropriations reimbursed as provided for by law.

In making requisitions on the general depot for supplies and other articles needed in the Service a new method of charging the amount of such requisition to the district making the request, accompanied

by an automatic transfer of funds, has been put into operation. The former practice was to provide the general depot with sufficient funds to meet all requests and not to charge the cost to the districts making such requests, which in some cases resulted in larger requisitions being made than were immediately necessary, and it is believed that a considerable economy has been effected by the establishment of this new method.

Commutation of subsistence on lighthouse vessels, authorized by the act of August 24, 1912, was put into effect on a number of tenders shortly after the passage of the act, and has proven successful in reducing office work in the preparation of proposals and other papers for subsistence supplies. It has also been conducive to the comfort and satisfaction of the complements of vessels. It is now being extended to light vessels under proper restrictions as to reserve provisions.

A new schedule of complements and rates of pay for officers and crews of light vessels was put into effect during the year. This was a part of the general reorganization of the Lighthouse Service contemplated by the act of June 17, 1910, and has had the effect of standardizing the pay scale for different types of vessels and stations.

Revision was made of the schedule of officers of tenders, under which there were authorized 16 second officers and 9 second assistant engineers for certain tenders where the needs of the Service require a licensed officer who may be placed in charge of the vessel or its machinery, 4 positions each of cadet officer and cadet engineer for the Atlantic coast and Lake districts, and 1 position each of cadet officer and cadet engineer for the Pacific coast districts. These positions are in the Lighthouse Service at large, in order that these cadet officers and cadet engineers may be transferred as their services may be required, thus giving young men who enter the Service in these positions a varied experience in lighthouse-vessel work and fitting them for more responsible duties.

The Department has submitted for the consideration of Congress an estimate to increase the appropriation for salaries, lighthouse vessels, in order that more adequate pay may be given to the crews of lighthouse vessels. There has been increasing difficulty in obtaining competent seamen and others of crews for such vessels in recent years, and as a result lighthouse tenders engaged in important buoy work have during the past season not been able in some cases to maintain full crews or have had their crews made up largely of inexperienced men. This condition is believed to be due to the fact that the pay of these crews, and particularly of the seamen, has not been increased for a number of years, whereas pay in other Government services and in the merchant marine generally has been raised. For

instance, the pay of seamen in the Revenue-Cutter Service on the Atlantic coast was increased by 20 per cent five years ago and is now that much higher than the similar pay in the Lighthouse Service, and, in addition, such seamen receive an allowance for uniforms and for reenlistment. The work of seamen on tenders of the Lighthouse Service is unusually severe, and thoroughly competent men are required to render these vessels efficient on the important work in which they are engaged.

New regulations for shore liberty and annual leave for keepers of light stations and officers and crews of light vessels were put into effect during the fiscal year. These provide for a maximum of shore liberty and leave of 72 days a year for keepers and 90 days a year for crews of light vessels. Regulations providing for leave of absence for crews of tenders were also issued.

Authority has been granted to allow to members of crews who are sick in hospitals, and who have served on a lighthouse vessel for at least one year preceding the date of entrance into the hospital, pay for not exceeding 60 days of the confinement in hospital, provided such members of crews return to duty and serve for two months or more thereafter.

New log books for vessels were issued which provide for recording the necessary information in a more systematic and compact form.

Regulations providing for a systematic method of advertising proposals for furnishing materials, services, or supplies, through newspapers and otherwise, were issued during the year.

A drawing showing the various types of buoys used by the Lighthouse Service was issued, for the assistance of officers of lighthouse tenders charged with the work of relieving and establishing such

Instructions for the operation of different types of *buoys* issued.

Inspectors are required to report annually the condition of all spare property or equipment. These reports are then consolidated by districts in order that an economical use of equipment not needed by one district may be effected.

The application of the provisions of the act has considerably facilitated the work required from time to time.

Cards giving general rules for the management of light stations were printed for posting at light stations. Light Station, at Atlantic City, was visited for the months ended September 30, 1901. This station is visited annually by the station in the United States.

During the year an inquiry was made concerning the extent, accessibility, and historical nature and value of all archives of the Lighthouse Service up to the year 1873.

New civil-service regulations for the Lighthouse Service were published.

There were issued new regulations prescribing uniforms for officers and crews of vessels of the Lighthouse Service.

COOPERATION.

Special effort has been continued to consult the needs of maritime interests as to aids to navigation and to cooperate with other branches of the Government having interest in or relations with the work of this Service.

Cooperation with the engineer officers in charge of river improvements in the river districts has been continued, and has proven particularly advantageous in the prompt change of aids when needed by engineer vessels in the vicinity, making it unnecessary to await the arrival of the lighthouse tender. Altered channel conditions and the adjustment of aids at the opening of navigation in the spring are thereby handled more expeditiously than in former years.

Arrangements were made with the Navy Department and the Revenue Cutter Service for making prompt report directly to the nearest lighthouse inspector concerned of any deficiencies observed in aids to navigation.

A joint regulation approved by the War Department and the Department of Commerce providing for the marking of wrecks and making arrangements for the removal of same was issued. Arrangements were also made for general cooperation with the Revenue-Cutter Service and the Office of the Chief of Engineers, War Department, for the removal of wrecks, derelicts, and other obstructions to navigation. The commanding officers of revenue cutters will promptly notify the nearest lighthouse inspector whenever wrecks are buoyed or lighted by vessels of the Revenue-Cutter Service, in order that such information may be published in the weekly Notice to Mariners.

LEGISLATION AFFECTING THE LIGHTHOUSE SERVICE.

In addition to the maintenance appropriations for the current fiscal year, appropriations for the following special works have been made since the close of the year: Depot for the sixth lighthouse district, \$125,000; aids to navigation in Atchafalaya Entrance Channel, La., \$50,000; light vessel for the Southwest Pass Entrance to the Mississippi River, La., \$125,000; light station on Navassa Island, West

Indies, \$125,000; improvement of aids to navigation at Ashtabula Harbor, Ohio, \$45,000; improvement of fog-signal station at Cleveland, Ohio, \$17,600; light and fog-signal station and improvement of aids to navigation at Lorain Harbor, Ohio, \$35,000; aids to navigation at Ashland, Wis., \$25,000; pierhead light and lighted buoy at Oconto Harbor, Wis., \$5,000; aids to navigation in Manistique Harbor, Mich., \$20,000; light and fog signal at or near Cape St. Elias, Alaska, \$115,000; aids to navigation and improvement of existing aids in Puget Sound and adjacent waters, Wash., \$30,000; improvement of Warrior Rock Light Station, Oreg., \$2,000; completion of unfinished portion of Government road from Rollerville to the Point Arena Lighthouse, Cal., \$3,000.

The following works were authorized at the limits of cost specified, no appropriations being made: Lighthouse tender for general service, \$250,000; light vessel to be placed near Monhegan Island, Me., \$125,000; carpenter shop at the general lighthouse depot, Tompkinsville, N. Y., \$23,000; light and fog-signal station at or near North Farallon Island, Cal., \$100,000.

The use of the unexpended balance of the appropriation of \$15,000 heretofore made for a light and fog-signal station at or near the west end of the draw near the Lehigh Valley Railroad bridge at Passaic, N. J., for establishing beacon lights to mark the channel in Newark Bay, N. J., was authorized.

The purchase for lighthouse purposes of approximately one-half acre of land in the vicinity of the lighthouse reservation at Port Ferro Light Station, P. R., for the purpose of constructing a watershed and cistern, and making the appropriation "General expenses, Lighthouse Service," for the fiscal year in which the purchase is effected available therefor, was authorized.

The purchase of necessary additional land for light stations and depots, under rules prescribed by the Secretary of Commerce, was authorized, no single acquisition of such additional land to cost in excess of \$500. Authority was later given for the payment for such land to be made from the appropriation "General expenses, Lighthouse Service," and the total sum to be expended for this purpose in any fiscal year restricted to \$3,000.

Authority was granted for the furnishing of supplies and equipment for special work of the Lighthouse Service from general stock, and the reimbursement of the appropriation "General expenses, Lighthouse Service," from the respective appropriations for special works.

Authority was granted for the appraisal and sale, either by sealed proposals for the purchase of the same or by public auction, after advertisement of the sale for such time as in the judgment of the Secretary of Commerce the public interests require, of any con-

damned supplies, materials, equipment, or land which can not be profitably used in the work of the Lighthouse Service, the proceeds of such sales, after the payment therefrom of the expenses of making the sales, to be deposited and covered into the Treasury as miscellaneous receipts, as now provided by law in like cases.

Authority was granted for the payment of \$1,642.55 to the officers and crew of the tender *Mansanita* for personal-property losses sustained by them on the foundering of that tender on October 6, 1905.

Authority was given to pay a claim in the sum of \$22.50 for damages occasioned by a collision for which a vessel of the Lighthouse Service was found to be responsible.

APPROPRIATIONS.

The estimates for maintenance appropriations for the year 1911 were divided into one appropriation for general expenses of supplies, repairs, etc., and three appropriations for salaries, with an alternative providing for all maintenance appropriations in a single item. This alternative proposition was not authorized by Congress. It is believed, however, that with this form of appropriation a more economical and efficient administration of the Lighthouse Service could be effected, and in the estimates for the next fiscal year attention has been drawn to the fact.

Besides the estimates for maintenance, estimates for 29 special works have been submitted aggregating \$1,625,500. These include 3 new lighthouse tenders, 1 new light vessel, 3 new light and fog signal stations, 2 new light stations, 1 new lighthouse depot, 5 items for establishing or improving aids in general localities, 1 item for a new system of harbor or channel lights and other aids, 8 items for improvements of light or fog-signal stations or of groups of aids to navigation, 2 items for improvement of lighthouse depots, and 1 item for light keeper's dwellings.

AIDS TO NAVIGATION.

During the fiscal year ended June 30, 1911, there was a net increase of 592 in the total number of aids to navigation maintained by the Lighthouse Service, including light vessels, 56 lights above the grade, of minor lights, 10 fog signals, 4 submarine bells, 171 daymarks, 5 lighted buoys, 14 unlighted buoys, and 11 minor lights.

Fixed lights were changed to flashing or occulting at 29 stations. The illuminant of 7 lights was changed to incandescent oil vapor, and the illuminant of 20 lights was changed to acetylene. Six new light vessels were established during the year. On June 30, 1911, there were maintained by the Lighthouse Service 15,479 aids to navigation, including 2,739 lights of all classes and 560 fog signals, of which 41 are submarine signals.

Following are some of the more important aids which have been established or materially improved during the past fiscal year:

Second order incandescent oil-vapor light established: Kilauea Point, Kauai Island, Hawaii, about 250,000 candlepower.

Fourth order incandescent oil-vapor lights established: Miah Maull Shoal, N. J.; San Pedro Breakwater, Cal.; Alki Point, Wash.; Superior Entry South Breakwater, Wis.

New light vessels placed on station: Milwaukee *No. 95*, Wis.; Buffalo *No. 96*, N. Y.

South Pass Light Vessel *No. 43*, La.: Moved to Southwest Pass, Mississippi River.

Bush Bluff Light Vessel *No. 97*, Va.: Changed to flashing electric light.

First-class air sirens established: Point Loma, Cal.; San Pedro Breakwater, Cal.

Reed-horn fog signal established: Alki Point, Wash.

Fog bell established: Negro Point, N. Y.

Submarine fog bell established: Off Whitefish Point, Mich.; on Buffalo Light Vessel *No. 96*, entrance to Buffalo Harbor, N. Y.

A gas, whistling and submarine bell buoy was established at Orford Reef, Oreg.

Other important gas buoys established: Block Island North Reef, N. Y. (bell); Chesapeake Bay entrance, Va.; Neah Bay, Wash. (whistle); South Pass, Mississippi River, La. (whistle); Columbia River entrance, Oreg.-Wash. (2 buoys, 1 with whistle); Joe Flogger Shoal, Delaware Bay, Del. (bell); Boulder Reef, Lake Michigan.

Systems of minor aids and buoyage extensively rearranged or improved in important harbors: Boston Harbor, Mass.; Nantucket Sound, Mass.; Connecticut River, Conn.; Ambrose Channel, N. Y.; Delaware Bay and River, Del., N. J., and Pa.; Baltimore Harbor, Md.; Hampton Roads, Va.; Newport News, Va.; Tybee Roads, Ga.; St. Johns River, Fla.; Key West Harbor, Fla.; Tampa Bay, Fla.; Mobile Bay, Ala.; Sabine Pass, Tex.; Niagara River, N. Y.; Maumee Bay and River, Ohio; Detroit River, Mich.; Columbia River, Oreg.-Wash.

Flashing acetylene lights established: Blank Island, Spanish Island, Sukoi Islets, Cape Fanshaw, Shakan Bay, Key Reef, Lone Tree Point, Point Helen, Busby Island, Seal Island, Point Hugh, Grave Point, Lord Rock, Alaska; Milwaukee South Pierhead, Manitowoc South Breakwater, Wis.; Galveston Bay Channel, Tex.; Reeds Hammock, N. C.; Cape Fear River, N. C. (10 lights); Negro Point, N. Y.; Livingstone Channel, Detroit River, Mich. (6 lights).

The mildness of the past winter has permitted keeping on station many gas buoys which ordinarily are removed during the season of heavy ice. In the Delaware River and Bay, for the first time since

gas buoys were established there, half of the gas buoys were maintained on station throughout the winter.

Measures have been taken for improvement in the marking of light-vessel stations for the purpose of lessening the danger of an approaching ship mistaking one light vessel for another. The names of light vessels have been simplified, thus permitting the distinguishing word for the vessel to be painted in larger letters, which can be read at a much greater distance. In every case the important distinguishing word has been retained on the vessel, so that there is no difficulty in the mariner identifying the station. These recent improvements made to avoid danger in confusing relief light vessels consist in assigning code-signal letters to every light-vessel station and having the relief lightship display the code-signal letters of the station to approaching vessels whenever necessary to warn them of the name of the station, and also in having the relief vessel so equipped that at night she can show the identical light of the station ship, and during fog sound the identical fog signal; also the relief vessel will sound the same code number on the submarine bell. To avoid confusion when light vessels are off their stations while proceeding to or from port, all light vessels have been directed, under such circumstances, to show the international code-signal letters "QE," meaning lightship is not at anchor on her station.

The practice has been inaugurated of publishing from time to time special poster notices to mariners for the more important changes in aids to navigation. It is intended that these notices be displayed in such offices and places as are frequented by mariners, in order to bring important changes prominently to their attention. When practicable six months' advance notice is given of all important changes in seacoast aids, and the notice is repeated in the weekly Notice to Mariners in the first issue of each month until the change is carried into effect. The mailing list for notices is revised from time to time with a view of obtaining the maximum publicity for all changes.

Regulations issued during the year for standard-size buoy letters and numbers have had the effect of producing general uniformity in this system of marking throughout the Service.

Arrangements have been made with the United States naval radio station at Arlington, Va., to send by wireless twice a day to shipping along the Atlantic coast important emergency information regarding aids to navigation.

A board, consisting of engineer officers of the Army and lighthouse inspectors, appointed October 29, 1912, to consider and report upon the most feasible, advantageous, and economical method of providing suitable aids to navigation at or near the extremity of the south jetty at the mouth of the Columbia River, Oreg., recommended a system of buoys and range lights, which have since been established.

ALASKA.

The total number of aids to navigation in Alaska, including lights, fog signals, buoys, and daymarks, in commission at the close of the fiscal year ended June 30, 1913, was 279, including 93 lights, representing an increase of 56 lights since June 30, 1910, or 150 per cent. The following table, which gives the total number of aids to navigation on June 30 of each year named, illustrates the progress in establishing aids in the Territory:

Aids.	1910	1911	1912	1913
Lights.....	37	71	85	93
Fog signals.....	9	10	10	10
Buoys.....	84	105	132	136
Daymarks.....	30	29	38	40
Total.....	160	215	265	279

The work of rebuilding and improving the present light and fog-signal station at Lincoln Rock, under the special appropriation of \$25,000 made by the act of March 4, 1911, has been completed.

The act approved March 4, 1913, authorized a light and fog-signal station at or near Cape St. Elias, at a cost not to exceed \$115,000, and an appropriation of this amount was made subsequent to the close of the fiscal year.

An estimate for an appropriation of \$325,000 for a new tender to replace the *Armeria* will be included in the Department's estimates for the fiscal year 1915, which will also include an item of \$60,000 for the establishment of aids to navigation and the improvement of existing aids in Alaska.

ENGINEERING AND CONSTRUCTION.

A number of new works under special appropriations were completed during the fiscal year. Those of principal importance are as follows: New fog signal at Manana Island, near Monhegan Island, Me.; wharf, power house, and foundry at the general lighthouse depot, Tompkinsville, N. Y.; new light and fog bell at Negro Point, East River, N. Y.; new lighthouse at Miah Maull Shoal, Delaware Bay, N. J.; a portion of new lights for Cape Fear River, N. C.; new lighthouse and fog signal, with minor lights, at Superior Entry, Wis.; beacon lights and buoys for Livingstone Channel, Detroit River, Mich.; 13 new acetylene lights in Alaska; reconstruction of lighthouse and fog signal at Lincoln Rock, Alaska; new light and fog signal, Alki Point, Puget Sound, Wash.; new lighthouse and fog signal at San Pedro Breakwater, Cal.; new fog signal at Point Loma, Cal.; new lighthouse at Kilauea Point, Hawaiian Islands.

Other important work in progress at the close of the fiscal year includes a new light and fog signal at Thimble Shoal, Chesapeake Bay, Va.; new light and fog signal at Brandywine Shoal, Delaware Bay, N. J.; lights and buoys for channels leading to Baltimore, Md.; general improvements at San Juan Depot, P. R.; new light and fog signal at Buffalo Breakwater North End, N. Y.; and new system of lights (43 in all) for St. Marys River, Mich.

The most noteworthy example of construction accomplished during the fiscal year was the construction of foundations for 10 beacon lights marking the Livingstone Channel, Detroit River, Mich. The concrete foundations of 6 of the beacon lights were constructed in place in the cofferdam built by the engineer officers for the purpose of taking out the principal rock cut, thus avoiding the heavy expense which would have been incurred had it been necessary to place these foundations under water. The remaining four foundations were constructed by building reenforced concrete cribs at a selected point within the cofferdam, afterwards towing them downstream to their proper positions, sinking them by means of sluice valves provided for the purpose, then pumping out the water from the interior of the cribs and filling them with concrete. This also proved to be an economical method of construction. Iron ice guards around the water line are provided for all concrete foundations. Acetylene illumination was provided for the beacon lights.

A new type of cast-iron mast supporting a cylindrical tank shelter, surmounted by an acetylene lantern, has been developed and installed in exposed positions on breakwaters which in times of storm are swept by the sea to a depth of 10 feet. The structures have withstood this test and have given general satisfaction.

Old wooden beacons have been replaced by concrete structures, which have been found superior in resisting ice damage. In one case, where in former years the old wooden rock-filled crib was overturned by ice every winter, a concrete structure has now stood without damage for two years.

Some experimenting and work was done with oil concrete—Portland cement concrete with addition of a paraffin base residue mineral oil—and the results have so far been satisfactory in preventing leakage or absorption.

A tripod beacon was built of reenforced concrete in place of wood, and work on another was nearly completed. A much more durable and permanent construction has been effected, and other beacons of this type will be built in the future.

To lessen possible damage from fire at light stations a number of isolated oil houses have been built during the year for the storage of inflammable supplies.

A standard legend to be placed on all drawings, tracings, and blue prints made throughout the Service was developed during the year. Standard photolithograph drawings and instructions covering various types of incandescent oil-vapor lamps were issued during the year, to be placed in a proper place for ready reference by keepers and other employees charged with the use of same.

Arrangements were made to provide each district office with a small collection of modern technical reference books for use in designing and other engineering work of the Service.

IMPROVEMENT OF APPARATUS.

Until lately it has been necessary to procure all the cut glass lenses used in the Lighthouse Service from either France, England, or Germany, most of them coming from France. Recently the matter was taken up with an American firm of glass manufacturers with a view to ascertaining if a better lens could not be made in this country than abroad by using some modern manufacturing methods. The results to date have proven satisfactory. The lenses are superior to those purchased abroad and can be made for the same cost or less. The essential feature of the American method of manufacture is that the prisms are formed by machines instead of by hand. Every part is made to fit an accurate template or jig, so that they are true to size and parts of the same number are completely interchangeable. It is hoped that in a short time American factories will be equipped to furnish all lenses except those of large size, for which the demand is too small to warrant the large equipment cost necessary.

Improvements have been made in pressed glass lens lantern and buoy lantern lenses, and tests show them well adapted for many conditions of the Service, at a decrease in expense.

Efforts with a view to the standardization of articles manufactured at the general lighthouse depot, Tompkinsville, N. Y., were continued. Practically all articles manufactured at that depot are now made from jigs and templates, so that all parts are duplicate and interchangeable. The making of proper tools and installation of modern machinery is still in progress, and it is expected to reduce costs of manufacture further.

Wick lamps have been gradually replaced by incandescent oil-vapor installations at a number of important stations, thereby producing a much brighter and more efficient light, which has proven satisfactory to mariners and elicited favorable comments from them.

A device to call the attention of the keeper to any abnormal condition of his light has been prepared and fitted to a third-order vapor lamp. It consists of a recording thermometer with electrical connections to ring alarm bells where required when the light burns

either too low or too high, and also keeps a chart record showing the operation of the light. Its use tends to greater attention on the part of keepers to insure uniform illumination. Other devices designed for the purpose of summoning the light keeper in case his light is not burning properly are being tried.

Experiments have been made with new types of post lanterns, and a lantern has been developed which it is believed will be an improvement.

Experiments have been made for the improvement of lens clocks or revolving apparatus, and a clock that is believed to be superior is being manufactured.

The use of devices to prevent birds from resting on buoys and dis-coloring them was extended during the year.

An improved type of torch for starting oil engines was designed.

A vapor lamp using three 55-millimeter mantles was developed, for use in first and second order lenses, that gives promise of operating successfully.

Some improvements were made in the construction of single oil-vapor lamps, in the direction of better control and simplification of cleaning operations.

The question of installing acetylene fog guns for trial at several light stations in this Service is under consideration. These fog guns were tried recently by the Scotch Lighthouse Service with apparently satisfactory results.

VESSELS.

Milwaukee Light Vessel *No. 95*, Wis., has been completed and placed on station.

Contract has been awarded for the construction of light vessels *No. 96* and *No. 98*, the former to be stationed about 13 miles southwest from Buffalo Harbor North Entrance and the latter to be used as a relief vessel on the Great Lakes. Contract has also been awarded since the close of the fiscal year for the single-screw, steam-propelled lighthouse tender *Laurel*, for service in the fifth lighthouse district.

The tender *Woodbine* is still under construction, its completion having been delayed by the failure of the contractor and by delay in the furnishing of the propelling engine. It is expected that the vessel will be ready for service about November, 1913.

Diamond Shoal Light Vessel *No. 71*, N. C., was greatly improved by fitting new boilers, compounding the propelling engine, and replacing one of the steam-driven electric generating sets for the signal light and radio service by an oil-engine outfit of the same capacity. The speed of the vessel has been increased, while the coal consumption has been reduced. A further economy has been effected in the

avoidance of the dangerous labor of frequently coaling the vessel at sea, as well as in a saving of the time of the tenders and the labor of their crews, as oil is safely and quickly delivered.

Bush Bluff Light Vessel, Va., has recently been fitted with a new system of electrical signal lights. It consists of one parabolic silvered reflector mounted on a compound pendulum and revolved by an electric motor to show a flash every 10 seconds. The light is furnished by a concentrated Tungsten filament incandescent lamp of 30 candlepower, fixed in the focus of the reflector, and gives a flash estimated at about 80,000 candlepower. The current for the operation of both the lamp and motor is furnished by storage batteries, which are sent ashore for recharging at convenient intervals. This is the first installation of a signal light of this character in the world.

Regulations providing for the standard painting of under-water surfaces of Lighthouse Service vessels were issued after a number of experiments and service trials of various compositions. These regulations cover the various conditions under which these vessels must operate, both in salt and fresh water.

Supplementary to these regulations, instructions were also given for the periodic docking of all vessels at regular intervals, depending on type of vessel and locality of station.

SAVING OF LIFE AND PROPERTY.

During the fiscal year 1913 services in saving of life and property were rendered and acts of heroism performed by employees of the Lighthouse Service on vessels or at stations on 92 occasions.

COAST AND GEODETIC SURVEY.

GEODETIC WORK.

A reconnoissance was made for the extension of the primary triangulation along the ninety-eighth meridian from Alice, Tex., to the Mexican boundary, to connect with the triangulation executed by the Mexican Government. The triangulation of the coast of Louisiana in the vicinity of Cote Blanche and Atchafalaya Bay, and of Laguna Madre, Tex., was revised.

Primary triangulation was extended along the one hundred and fourth meridian from the vicinity of Colorado Springs, Colo., to the Canadian boundary, a distance of 720 miles. A secondary triangulation along the coast of Washington was begun. Precise leveling was completed on the line between San Francisco, Cal., and Brigham, Utah, and was begun on a line between Crookston, Minn., and Butte, Mont.

Determinations were made of the difference of longitude of stations near the one hundred and fourth meridian in Nebraska, Colorado, Wyoming, and Montana.

The geographic positions of numerous aids to navigation and of radio stations along the Atlantic and Pacific coasts were determined.

MAGNETIC WORK.

Observations for magnetic declination, dip, and intensity were made at the magnetic observatories maintained by the Survey at Cheltenham, Md.; Tucson, Ariz.; Vieques, P. R.; Sitka, Alaska, and Honolulu, Hawaii. Seismological and meteorological observations were continued at the observatories and special observations were made in accordance with plans adopted for international cooperation. Magnetic observations were made in the field at a large number of stations in the United States and in the Philippine Islands and meridian lines were established when requested by local authorities.

Magnetic observations at sea and at shore stations were made by vessels engaged in general surveying operations.

HYDROGRAPHIC AND TOPOGRAPHIC WORK.

Atlantic coast.—The steamer *Bache* was engaged in inshore and offshore hydrography between Charleston and Savannah, including St. Andrews and Sapelo Sounds and Tybee and Port Royal entrances, and offshore work between Delaware and Chesapeake Bays.

The *Bache* was repaired at Boston between September 26 and October 27.

The steamer *Endeavor* was at work on the hydrography of Chesapeake Bay from Kedges Strait northward; in Narragansett Bay, R. I.; between Cowpen Island, Core Inlet, and Morehead City. The vessel was repaired at Baltimore between November 20 and January 2 and at Jersey City, N. J., between May 19 and 24 and June 24 and 30.

The steamer *Hydrographer* was employed on coast-pilot revision between Chesapeake Bay and Kest West, and in detached hydrographic surveys on the coast of Massachusetts and on the coast of North Carolina in the region between Cowpen Island, Core Inlet, and Morehead City. Repairs were made to this vessel at Baltimore between December 21 and January 20 and between June 19 and June 30.

The schooner *Matchless* completed a survey of the Pamunkey River, Va., to the head of navigation and began a survey of the southern and eastern branches of Elizabeth River. The *Matchless* was repaired at Baltimore between July 1 and 23 and between June 26 and 30.

Wire-drag work was done in the channel between Block Island, R. I., and Montauk Point, Long Island, N. Y.; in Buzzards Bay, Mass.; at Key West, Fla., and in the vicinity of Matinicus Island, on the coast of Maine.

A resurvey of the Delaware River from House of Correction Wharf to Trenton was completed and a survey of Newark Bay and the Hackensack and Passaic Rivers was begun.

Chart-revision work, including revision of shore-line changes, improvements, and additions, was continued in the vicinity of New York City and on Long Island Sound eastward from Stamford, Conn., and on the coasts of Maine and Massachusetts, and a survey was made of the dredged channel between Greater and Little Peconic Bays, N. Y. Preparations were begun at the close of the year for a series of current observations in the Potomac River.

Data were collected for the preparation of an inside-route pilot from Cape Sable, Fla., to New Orleans, La.

A hydrographic survey of Piscataqua River and Great Bay, N. H., was begun.

An officer of the Survey performed the duties of inspector during the year for the region from Narragansett Bay to Delaware Bay, inclusive. Information was obtained by this officer for chart corrections and notices to mariners, and data relating to charts, tides, and sailing directions were supplied to navigators and others interested. A revision was made of the shore line of Hog Island and portions of Rhode Island and Bristol Island and of the channels in the vicinity of Hog Island Shoal Light, R. I. The supervision of the construction of certain boats for the use of the Survey and of machinery and

boilers for the same and the collection of data relating to depths in channels and harbors are among the various duties performed by this officer, whose headquarters are at the New York customhouse.

Pacific coast.—The steamer *Explorer* was employed on the survey of the entrance of the Kuskokwim River, Alaska. The *Explorer* was repaired at Seattle and at the Puget Sound Navy Yard between January 20 and the early part of April, and afterwards a radio apparatus was installed on the vessel.

The party on the steamer *Gedney* was engaged in surveys in Kasook Inlet, Sukkwan Strait, Tlevak Strait, and San Cristoval Channel, Alaska, and in revision work at Tacoma, Olympia, and Seattle, Wash. The vessel was repaired at Winslow, Wash., between February 24 and April 4.

The steamer *McArthur* made hydrographic surveys in Cook Inlet in the vicinity of Aialik Bay and offshore between Aialik and Resurrection Bays; at Nakat Harbor, Burnett Inlet, and Iniskin Bay, Alaska. The *McArthur* was repaired at the Puget Sound Navy Yard between February 19 and April 15.

The steamer *Patterson* was employed in southeastern Alaska on the triangulation and topography of Clarence Strait and on surveys in the vicinity of the Shumagin Islands and Unimak Pass. During the winter the vessel was engaged in hydrographic work around the Island of Maui and off the west end of Molokai Island, Hawaiian Islands. Temperatures of sea water were obtained both in going to Hawaii and in returning. The *Patterson* was repaired at Seattle between July 1 and August 2 and in November and May. In May a radio apparatus was installed on the vessel.

The steamer *Taku* operated in the northwestern part of Prince William Sound between Naked Island and Port Wells and in the north arm of Simpson Bay and thence southward toward Knights Island Passage and westward from previous work on the mainland. The *Taku* was repaired at Cordova, Alaska, between April 2 and May 1.

The steamer *Yukon* was employed on the survey of Turnagain Arm, Cook Inlet, and in the approaches to the Kuskokwim River, Alaska. The *Yukon* was repaired at Seldovia between April 23 and May 10.

Revision work for the correction of charts was done at Blaine, Bellingham, Anacortes, Neah Bay, Port Angeles, Port Townsend, Richmond Beach, and Coupeville, on Puget Sound.

The revision of the triangulation and topography of the Island of Maui was completed and that of the Island of Hawaii was begun. The work was carried from Hilo around the northwest point of the island to Kawaihae.

An officer of the Survey continued in charge of the suboffice at San Francisco, acting as inspector for the coast of California. A resurvey was made under his direction of the United States immigration station on Angel Island, San Francisco Bay.

An officer, acting as inspector for the coasts of Oregon, Washington, and Alaska, stationed at Seattle, in addition to other duties, rendered valuable service in the preparation of specifications for repairs of vessels and of plans for a new launch for the steamer *Pathfinder*, in planning work for vessels in Alaska, and in collecting and furnishing information useful to navigators and for the correction of charts.

TIDES AND CURRENTS.

Tide observations were continued at regular stations maintained at Portland, Me.; Fort Hamilton, N. Y.; Atlantic City, N. J.; Philadelphia, Pa.; Baltimore, Md.; Fernandina, Fla.; Galveston, Tex.; San Diego, Cal.; San Francisco, Cal.; Seattle, Wash., and Juneau, Alaska, and at stations temporarily occupied in connection with hydrographic work. The tidal indicators at Fort Hamilton, N. Y.; New York City, and Reedy Island, Delaware River, were continued in operation.

Current observations were made in various localities by vessels of the Survey, and through cooperation with the Bureau of Light-houses by observers on light vessels along the Atlantic coast.

SPECIAL SURVEYS.

Many requests were received for special surveys in various localities. Reports of newly reported dangers to navigation were promptly investigated and when verified were made the basis of chart corrections and notices to mariners.

OUTLYING TERRITORY.

An officer of the Survey detailed to duty as director of coast surveys, with headquarters at Manila, has direction of the field work in the Philippine Islands. Excepting the steamer *Pathfinder*, the vessels engaged in that work are the property of the insular government, which provides the crews and keeps the vessels in repair. The salaries of the officers are paid by the Federal Government and the running expenses, including outfit, are divided between the Federal and insular governments.

Congress having made an appropriation for extraordinary repairs to the *Pathfinder*, that vessel was taken to Hongkong in December. The extensive repairs needed were completed by April 8, when the

vessel returned to Manila. The *Pathfinder* encountered several typhoons during the year, the most severe of which occurred on October 16, when she was lying at Cebu. Both of her launches were dragged from their moorings and swamped. One was recovered without serious damage; the other was lost.

On November 6 the steamer *Marinduque*, during a typhoon, was driven on shore and seriously damaged, necessitating extensive repairs.

The general localities in which the vessels were employed are as follows: The steamer *Pathfinder* was employed in general surveys on the southeast coast of Mindanao and the southwest coast of Negros; the steamer *Fathomer* was employed on general surveys in the vicinity of the Cuyos Islands and Apo Reef, Busuanga Island, and between the Cuyos Islands and Palawan; the steamer *Marinduque* was engaged in general surveys in Ragay Gulf, southwestern Luzon, on the west coast of Mindanao, and on the west coast of Mindoro; the steamer *Romblon* was at work in the area bounded by Luzon, Burias, Masbate, and Tablas Islands, in the vicinity of the Lubang Islands and the Calamianes Group, and the steamer *Research* made surveys in the area bounded by Samar, Leyte, Biliran, and Masbate Islands.

Tidal observations were made in connection with the work of the hydrographic parties.

Magnetic observations were made at a number of stations in the Philippine Islands.

In the Hawaiian Islands triangulation and topographic and hydrographic surveys were continued, and the usual observations were made at the permanent magnetic observatory maintained by the Coast and Geodetic Survey at Honolulu.

Through the courtesy of the surveyor general of Hawaii tide observations made by the Territorial government are furnished to the Coast and Geodetic Survey.

A permanent magnetic observatory is maintained by the Survey at Vieques, P. R.

INTERNATIONAL BOUNDARIES.

The Superintendent is commissioner on the part of the United States for the survey and demarcation of the boundary line (excepting certain water boundaries) between the United States and Canada and between Alaska and Canada, and the field work is conducted by parties under his direction. The expenses of the work are defrayed from a special appropriation made to the State Department.

United States and Canada boundary.—During the fiscal year the following work was completed:

On the boundary east of the summit of the Rocky Mountains between the Red River of the North and Lake of the Woods 95 miles of

topography along the boundary were completed, 82 miles of vista were cut, 102 miles of boundary were located, and 155.5 miles of levels were run. The triangulation was extended along the boundary for a distance of 87 miles, and the triangulation of the Lake of the Woods was completed. A base line was measured at Fort Frances, Ontario. Seventy-five monuments were set on the boundary. The meridian boundary to its intersection with the southeast boundary was located and marked.

Twenty-five miles of triangulation on the Lake of the Woods were done by a Canadian party, to which an American surveyor was attached, and a hydrographic survey of the lake along the boundary was made.

Between Pigeon River and Lake of the Woods triangulation and topography were completed from Round Lake to a point beyond the western end of Knife Lake, a distance of about 41½ miles.

On the northeastern boundary between Maine and New Brunswick 31.5 miles of boundary were measured, 37 miles of levels were run, and 42.39 square miles of topography were completed. A lane 30 feet in width was cut through the dense forest along this portion of the boundary. In the valley of the St. Croix River 18 square miles of triangulation and 2 square miles of topography were completed and reference marks were placed on Monument Stream.

Alaska boundary.—The line tracing of the one hundred and forty-first meridian boundary was completed from the close of the previous work to the shores of the Arctic Ocean, a distance of 22 miles. The triangulation was carried for a distance of 51 miles to the ocean shore and extended eastward for 25 miles to determine the relation of the terminal monument to the shore line. The topography along the boundary was surveyed for a distance of 49 miles and extended along the ocean shore to include Icy Reef, Beaufort Bay, and Demarcation Point to the west and Clarence Bay to the east. Vista cutting and stadia measurement were also completed, covering a distance along the boundary of 91 miles. Fifty-six monuments were placed on the boundary north of the Porcupine River to the Arctic, covering a distance of 80 miles, and south of the Porcupine, 78 miles.

In the region south of Mount Natazhat the triangulation was carried from Scolai Pass to within 30 miles of the boundary, a distance of 90 miles, and the reconnoissance to within 8 miles of the boundary. The topography was extended from the mouth of Canyon Creek, on the Chitina River, up the valley of the latter to and along the one hundred and forty-first meridian northward toward Mount Natazhat as far up the Anderson Glacier as practicable, including the tops of the ridges on either side, and photographs were taken from which an additional area can be plotted.

PUBLICATIONS.

The publication of charts, coast pilots, and tide tables and of the results of the geodetic, magnetic, tidal, and other work of the Survey was continued. An inside-route pilot, describing the inside passages between New York and Key West, was prepared and published, supplying a demand for information along this route which had not before been adequately met.

A revised edition of the Regulations and Instructions for the Government of the Coast and Geodetic Survey was issued during the year.

The publication of the results of surveys of oyster beds in cooperation with the State of Maryland was nearly completed.

The annual report of the Superintendent was, by direction of the Department, published in octavo form and the results and discussions of the work, which had previously appeared as appendixes to the report, were issued as separate publications.

A number of publications were in press or in course of preparation at the close of the year.

SPECIAL DUTY.

An officer detailed for duty with the Maryland Shell Fish Commission continued on duty in charge of office work and the preparation of maps, reports, and publications. Assistance was rendered by the same officer to the Oyster Survey Commission of the State of Delaware without expense to the Federal Government.

Two officers of the Survey were detailed to represent the Department of Commerce at the Conference of Port Authorities. Both of these officers attended the meeting in New York, and one of them also attended the meetings of the conference at Boston, Philadelphia, and Baltimore.

The Superintendent and the inspector of geodetic work, as delegates on the part of the United States, attended the meeting of the International Geodetic Association.

The usual supervision was given to the work of the observatories maintained by the International Geodetic Association for determining the variation of latitude at Gaithersburg, Md., and Ukiah, Cal.

An officer of the Survey, in addition to other duties, continued to act as a member of the Mississippi River Commission.

The Superintendent is chairman of the board appointed by the Secretary of the Treasury to examine and report upon life-saving appliances.

During the winter season a number of officers were engaged in determining the positions of radio stations along the Atlantic and Pacific coasts, as requested by the Bureau of Navigation of the

Department of Commerce. A special survey was made of the grounds of the Hygienic Laboratory of the Public Health Service in the District of Columbia.

A special hydrographic examination was begun in the Potomac River to determine the extent of the pollution of water. Hydrographic examinations were made also in the channels of Greater and Little Peconic Bays, Long Island; of Piscataqua River and Great Bay, N. H.; of the harbor of refuge at Point Judith, R. I., and of the outer and inner harbors at Delaware Breakwater.

ASSISTANCE RENDERED IN SAVING LIFE OR PROPERTY.

On October 7 the steamer *Hydrographer* rendered assistance to a four-masted schooner which had stranded near the Marconi Towers, Cape Cod. The U. S. S. *Cyrus W. Field* and the revenue cutter *Gresham* succeeded in getting the vessel afloat. The *Hydrographer* also assisted the schooner *Sallie Purnell Beswick* while aground in North Landing River, N. C.

Assistance was rendered by the steamer *Gedney* to the Pacific Coast Steamship Co.'s steamer *Curacao*, which ran aground near Fish Egg Island, Alaska. With the aid of the *Gedney* the vessel was on that occasion got afloat, but was afterwards unfortunately wrecked in Tonawek Bay. The *Gedney* at the time of this disaster took off the passengers and crew of the *Curacao* and conveyed them to Ketchikan, the nearest port of call for steamships.

During a severe typhoon in the Philippine Islands on October 15 and 16, a volunteer boat's crew from the steamer *Pathfinder* succeeded at great personal risk in rescuing the crew of a wrecked vessel. The *Pathfinder* also towed to a safe anchorage the steamer *Lizarago*, which was sighted in distress.

The officers of the steamer *Research* aided in extinguishing a fire on a new tugboat in the dock on Engineers Island in Manila Bay.

RECOMMENDATIONS.

Housing conditions.—The buildings occupied by the Bureau are antiquated and not adapted to the efficient and economical conduct of its business. The main building was erected more than forty years ago. It was rented by the Coast Survey in 1871, but was not acquired by the Government until 1891. Part of the buildings are what was formerly a stable, and the walls in some places are in such condition that they have to be shored up to keep them from falling. The land on which the buildings stand belongs to the Government. More suitable and enlarged quarters are urgently needed. Additional facilities are especially necessary for the lithographic and plate-printing establishments.

Chart construction.—On account of the character of the work of the chart-construction division, ample, well-diffused daylight is essen-

tial in order to properly deal with the fine details of the charts. The present quarters are inadequate for the growing demands on this department of the work, not only in the respect of light but also as regards heat, ventilation, and proper supervision. The whole building plant is out of date and discreditable to the Government. An increase in the personnel and equipment is necessary to meet the urgent demand for an increased output of charts. Four additional presses for printing from aluminum plates are needed in the printing section and two additional vats in the electrotyping section.

The total issue of charts for the year was 143,694, an increase of 12,357 over the previous year. In addition 5,329 charts were issued by the suboffice at Manila, P. I. There are now 149 sales agencies for charts, coast pilots, and tide tables, not including the subagencies of the Manila office.

Vessels.—Most of the vessels of the Survey have been a long time in use and require a large expenditure for repairs to keep them in condition for service. The annual appropriations for repairs is barely sufficient to provide for the ordinary repairs, and for any extraordinary repairs it becomes necessary to ask for additional appropriations.

The demand for surveys on the Pacific coast and particularly in Alaska is most urgent. It is earnestly recommended that provision be made for the construction of three new vessels, one of which is intended to replace one of the older ones in Alaska.

The construction of three small vessels for wire-drag work and resurveys on the Atlantic coast, to take the places of launches which it is now necessary to hire for that work, would be a means of economy and would increase the annual output of work.

The extension to the Coast and Geodetic Survey of the law providing for the compensation of employees for injuries incurred in the line of duty would be a matter of justice, as these employees are often required to work in situations and to engage in occupations where the danger of accident is great.

Triangulation of the Yukon River.—The triangulation of the Yukon River in Alaska as a permanent basis for topographic, geologic, and land surveys in that region is a project which has been recommended in the estimates of annual appropriations for several years past as a most desirable object and well worthy of attention. It is hoped that provision will be made for this work during the next regular session of Congress.

The work of the Coast and Geodetic Survey suffers seriously from inadequate clerical force, but especially from having to do its work under the most costly conditions, in unsuitable old buildings, with inadequate equipment, so arranged that every operation is more expensive than it ought to be, and under the constant risk of irreparable damage from fire.

STEAMBOAT-INSPECTION SERVICE.

STATISTICAL SUMMARY OF WORK.

During the fiscal year ended June 30, 1913, there were transported on vessels which by law are required to report the number of passengers carried 303,263,033 passengers. The total number of accidents resulting in the loss of life during this period was 66, an increase over the previous year of 27, and the number of lives lost was 436, including passengers and crew, an increase over the previous year of 172. Of the total number of lives lost, 226 were from suicide, accidental drowning, and other similar causes, which leaves 210 which can fairly be chargeable to accidents, collisions, explosions, or foundering. The total number of 436 lives lost, when compared with the number of passengers that were carried, makes a ratio of 1 life lost, including passengers and crew, for every 695,557 passengers carried.

The number of vessels inspected and certificated in the fiscal year 1913 was 7,965, with a tonnage of 9,071,992, an increase of 129 in number, with an increased tonnage of 316,712, compared with the previous fiscal year. Of the vessels certificated 6,395 were domestic steamers with a tonnage of 5,109,569, a decrease of 37 in number, with an increased tonnage of 237,037; and 450 were foreign passenger steamers with a tonnage of 3,427,314, an increase of 12 in number, with an increased tonnage of 42,409. Sail vessels and passenger barges to the number of 33 were inspected, with a tonnage of 16,298, a decrease of 5 in number and of 2,457 tons; and also 557 seagoing barges of 492,548 tons, an increase of 55 in number and of 34,303 tons over the previous year. Five hundred and thirty motor vessels with a tonnage of 26,263 were inspected and certificated, an increase of 104 in number and 5,420 tons over the previous year.

Licenses were issued during the year to 26,482 officers of all grades, a decrease of 1,554 from the preceding year. There were 7,670 applicants examined for visual defects, 84 of whom were rejected and 7,586 were passed. Compared with the previous year, these figures show an increase of 54 in the number examined and 176 in the number passed.

At the various mills 3,208 steel plates for the construction of marine boilers were inspected, a decrease from the previous year of 578, and of this number 208 were rejected. In addition to plates, there were inspected at the mills a large number of steel bars for braces and stay

bolts for marine boilers and also several hundred plates for stock and repair purposes. Many requests were received from other branches and departments of the Government for the testing of boiler material at the mills. These received the attention of the Service, and prompt reports were rendered to the proper officials.

During the year there were examined and tested at various manufacturing 233,683 life preservers, of which 3,289 were rejected.

The total number of persons in the Service at the end of the fiscal year ended June 30, 1913, was 260, consisting of 185 officers, 74 clerks, and 1 messenger. Three vacancies existed in the Service on that date.

PRECAUTIONS AGAINST OVERLOADING OF PASSENGER STEAMERS.

The Bureau has always made an earnest effort to prevent the overloading of steamers carrying passengers, and it is believed that it has succeeded in greatly reducing this practice. There are two factors to be considered in the matter of the number of passengers that steamers are permitted to carry. The first is, Have the inspectors permitted the vessel by her certificate of inspection to carry more passengers than she can safely accommodate? and second, Have the officers of the vessel permitted more passengers to be carried than is allowed by her certificate of inspection? Under section 4464, Revised Statutes, the inspectors are required to state in every certificate of inspection granted to steamers carrying passengers, other than ferryboats, the number of passengers of each class that any such steamer has accommodations for and can carry with prudence and safety. Thus local inspectors have exclusive jurisdiction in the matter of fixing the number of passengers that may be carried on board steamers. In a country such as ours, with so many varied local conditions and so many different types of vessels, this is possibly the best arrangement that can be made, but the judgment of all men is not the same, and one inspector may err in permitting a steamer to carry more passengers than its capacity justifies, whereas another may err in not permitting a steamer to carry as many passengers as might be safely and prudently allowed. If it were practicable to have a uniform and general rule by which passenger allowance could be estimated, it would be most desirable, but under the varying conditions it is practically impossible to put such a rule into effect. The Bureau, however, has repeatedly warned local inspectors that the responsibility is theirs and that they would be held responsible in the event of disaster, and it is believed that these warnings and instructions have had a good effect. There is one factor, however, by which the allowance of passengers has been substantially controlled, and that is the rules at present in force in regard to lifeboat equipment, for where steamers are boated according to the number

of passengers carried they are restricted in their passenger allowance by the extent of their equipment, and consequently can not carry a larger number of passengers than is justified by their lifeboat capacity.

The matter of preventing steamers from carrying more passengers than are allowed by their certificates of inspection received particular attention during the past season, and a system of having inspectors actually count passengers and submit reports on small cards has been instituted and soon will be in general use by inspectors of the Steamboat-Inspection Service and by customs inspectors. This will enable the Department to be in immediate and close touch with the counting of passengers on steamers and do much to prevent overloading. It is believed that the counting of passengers should be entirely under the control of inspectors of the Steamboat-Inspection Service, which, of course, would require additional inspectors, because the small number at present available is not sufficient for that purpose.

HULL INSPECTION.

An examination of the General Rules and Regulations Prescribed by the Board of Supervising Inspectors will show that the board has given studious and intelligent attention to the matter of boiler construction and inspection. The General Rules and Regulations in this regard are respected and frequently referred to by various authorities in this and other countries. It is the purpose of the Supervising Inspector General, however, to increase the efficiency of the hull inspection. A long step in this direction was taken at the last meeting of the Board of Supervising Inspectors, in January, 1913, when a rule was adopted providing that in the inspection of hulls, boilers, and machinery of vessels the rules promulgated by the American Bureau of Shipping governing material and construction of hulls, boilers, and engines, except where otherwise specially provided for by the Rules and Regulations, will be accepted by inspectors as efficient standards of excellence. This was the first official recognition of the work of the American Bureau of Shipping. It should be a matter of pride to all Americans interested in the development of the American merchant marine to establish a standard of American ship construction that will be distinctly American, and it is hoped that the day will soon come when American shipbuilders will be governed by American standards and American specifications.

There is already in the General Rules and Regulations a requirement that the owner of every new vessel of over 100 gross tons, when making application for first inspection of the vessel, shall furnish

the local inspectors of the district where the vessel is to be inspected drawings or blue prints, in plan and section, showing fully the general construction of the vessel, of wood, iron, or steel, including dimensions, spacing of frames, disposition of hull plates, outside and in, or of outside and inside planks, construction of decks, construction of transverse and longitudinal bulkheads and location of same, space between decks, and details of principal scarfs, and the owners are also required to furnish details of the shapes, dimensions, and unit weights of all structural parts of the hull and the kinds of material of which made, including kinds of wood. A full description of the riveting of all parts of an iron or steel hull must be furnished. These data in the hands of the local inspectors enable them more intelligently to examine the hulls of vessels, and in after years, as a vessel goes from one district to another, to keep in touch with it with a view to determining exactly the extent of deterioration.

The effect of the increase in the number of details and items for hull inspection has been most beneficial, and comparison of the Rules and Regulations now in force with those of 10 years ago will show that the Service has made steady progress in the direction of efficient and intelligent hull inspection.

REINSPECTIONS.

While it is necessary that local inspectors make very rigid examination of vessels at the annual inspection, it is apparent that no matter how rigorous the annual inspection may be steamers would not be kept in good condition were it not for the reinspections required by this Service. Every excursion and ferry steamer is reinspected at least three times during the year for which the certificate of inspection is issued, or during the season of navigation, and while these reinspections require an increased expenditure for operating the Service the added expense is more than justified by the results obtained.

TRAVELING INSPECTORS.

The supervising inspectors of steam vessels do considerable traveling in their districts, with a view to obtaining uniform administration of law therein, but the Office of the Supervising Inspector General should have two traveling inspectors, who, working under the direction of that Office, could do excellent work in making reinspections, and the Supervising Inspector General would thereby be in closer and more intelligent touch with both the local inspectors and the supervising inspectors. This is the custom in other departments and in private services, and is fully justified by results.

MOTOR VESSELS.

The extension of the steamboat-inspection laws to the 250,000 motor boats which are said to exist in the United States is probably unnecessary, and is certainly impracticable without a large increase of the inspection force and of appropriations. Nevertheless, the existing conditions respecting motor boats should not be allowed to continue. The Supervising Inspector General has frequently referred to the desirability of extending the inspection of motor boats.

The Department inspects the hull and machinery of all steam vessels over 65 feet long and limits the number of passengers to be carried thereon, except that it has no authority to control the number of passengers carried on steam ferryboats.

As the law stands, only such steam vessels under 65 feet long as are tugs and towboats are inspected. Steam vessels less than 65 feet long carrying passengers are not inspected, nor are the number of passengers on such vessels directly limited—both for lack of legal authority. If steam vessels between 40 and 65 feet long carry passengers, the Department approves the design only of their boilers and machinery. It can only control the number of passengers to be carried on such vessels under the present law by the indirect means of regulating the life-saving equipment.

The Department, however, has no direct power over a motor vessel either as regards passengers or machinery. It can inspect the hull, tanks, and piping, but only when the vessel is of 15 tons measurement or more, and when it carries passengers or freight for hire. If, for example, the motor vessel is a private vessel of over 15 tons measurement, the Department can not inspect her in any way. Even if she is a towing motor vessel of this size, there exists no lawful power to inspect her.

The Department can not limit the number of passengers carried for hire on a motor vessel, however big, except by fixing the life-saving equipment. Over motor vessels smaller than 15 tons the powers of the Department are limited to seeing them provided with the necessary life-saving equipment, lights, life preservers, and means of extinguishing gasoline fires. Here the present powers of the Government stop.

I wish to make this perfectly plain. If a Government inspector stands upon a dock watching a motor boat sail away with three times as many passengers as she ought to have and her machinery defective and her hull leaking, he would have no power in the premises, were she a motor boat under 15 tons measurement, except to see that there was a life preserver in good order provided for every passenger on board, that she had the proper lights and the proper

means of extinguishing gasoline fires, with a whistle and a bell of standard dimensions. He could, indeed, require such a vessel to have a licensed operator, but for that license no examination is required. The powers of the Department in this matter should be extended. Every man whose pleasures or pursuits take him upon the water may see that motor boats are frequently loaded with passengers or pleasure seekers beyond the margin of safety. Every motor vessel used for carrying passengers should be inspected by the local inspectors of steamboats and given a certificate of inspection. The examination need not be of such detail as that of a steamer, but it should be sufficiently thorough to assure the passengers and the public that such boats are in good condition. It should, however, further be provided that motor vessels may not transport passengers in excess of a fixed number, perhaps 20 or 25, unless such boats have been subjected to the full inspection prescribed for steam vessels, and unless those in charge of them have been licensed after examination in the same manner as corresponding officers on steam vessels. At present a person may obtain a license as operator of motor vessels without being a citizen of the United States or without being 21 years of age, and while being unable to read or write. Under the law, licenses to operators of motor boats are issued without any examination whatever. The inspectors of the Inspection Service are without authority to ask whether the person applying for such motor-boat license is color blind or whether he understands or can read the pilot rules. Yet such persons, having a license so obtained, may, and in fact do, take charge of motor vessels carrying passengers for hire. Operators of motor boats should be required to show that they are not color blind and have good vision, that they can read the pilot rules and laws, and that they have a reasonable knowledge of them. The existing conditions are a menace to the lives of innocent and unsuspecting passengers and should not be permitted to continue.

The measures proposed could be carried into effect in a reasonable time and at a moderate expenditure of the public funds and would involve no hardship or undue restraint upon an important industry. The inspection would put the owner of the boat to no expense. The reckless navigation of an uninspected motor vessel jeopardizes the lives of passengers on inspected vessels, as well as those on the motor boat itself.

The numbering of motor boats for identification as automobiles are numbered is very desirable.

TRANSPORTATION OF DANGEROUS ARTICLES.

By section 4472, Revised Statutes, the Steamboat-Inspection Service is given a certain control and jurisdiction over the transportation

of dangerous articles, but this control is confined to steamers carrying passengers. It does not extend to freight vessels. Dangerous conditions may arise in the transportation of articles that are not covered by section 4472, and the section should be amended so as to give the Steamboat-Inspection Service control over the entire situation, with authority to make regulations covering the water transportation of dangerous articles in somewhat the same manner as the Interstate Commerce Commission makes regulations covering the rail transportation of such articles. While there is not the same danger incident to the transportation of dangerous articles on freight steamers as on steamers carrying passengers, because there is not so large a number of persons on board freight steamers, yet if an explosion should occur on a freight steamer while passenger steamers were navigating near by the loss of life would be very great.

The Steamboat-Inspection Service is very particular about enforcing the provisions of the statutes in regard to the transportation of gasoline on steamers carrying passengers. Under the provisions of section 4472, Revised Statutes, the transportation of gasoline by steam vessels when such gasoline is carried by motor vehicles is not prohibited, but it is provided that all fire in such vehicles shall be extinguished immediately after the vehicles enter the vessels, and that the fire shall not be relighted until immediately before the vehicles leave the vessels. The statutes further provide that any owner, master, agent, or other person having charge of passenger steam vessels shall have the right to refuse to transport motor vehicles the tanks of which contain gasoline, naphtha, or other dangerous fluids, and so much do the steamboat companies fear the dangers of gasoline that many of them refuse to carry automobiles that have gasoline in their tanks. Chauffeurs, however, endeavor at times to evade the vigilance of the officers of steam vessels and violate the statutes, thereby jeopardizing the lives of many persons traveling on steamers.

The officers in charge of steam vessels, as well as the inspectors of the Steamboat-Inspection Service, make earnest efforts to see that the rule in regard to the transportation of gasoline on steamers carrying passengers is not violated, in which efforts every citizen should cooperate to the end that the lives of passengers on such steamers may be safeguarded.

DIVISION OF FIRST SUPERVISING INSPECTION DISTRICT.

The first supervising inspection district embraces all waters and rivers of the United States west of the Rocky Mountains, and the Hawaiian Islands. The supervising inspector stationed at San Francisco, Cal., has charge of the local inspection districts of San Fran-

cisco, Cal.; Los Angeles, Cal.; Portland, Oreg.; Seattle, Wash.; St. Michael, Alaska; Juneau, Alaska, and Honolulu, Hawaii. The territory covered by this district is extensive, and no one man, no matter how efficient he may be, can supervise it properly. It is believed, therefore, that the work of the first supervising district should be divided, and the supervising inspector stationed at San Francisco should be required to supervise only the local districts of San Francisco, Los Angeles, and Honolulu. A new supervising inspector should be stationed at Seattle to supervise the local districts of Seattle, Portland, St. Michael, and Juneau. This would permit more efficient supervision of the work in this territory. The Department in the estimates for the fiscal year 1915 asked for an additional supervising inspector, and if Congress makes an appropriation for the salary of this officer he will be assigned to duty as above described. In order to provide for such additional supervising inspector it will be necessary that section 4404, Revised Statutes, be amended to that effect.

At the last session of Congress authority was granted for the establishment of a board of local inspectors at Los Angeles, Cal., and appropriation was made, in the urgent deficiency bill approved October 22, 1913, for the salaries of a local inspector of hulls, a local inspector of boilers, and a clerk at that port.

CERTIFICATES OF INSPECTION.

The Department believes that it is not necessary to furnish steamers the large number of copies of certificates of inspection required by the present practice. The same purpose would be served if local inspectors furnished the original certificate direct to the vessel, supplying the collector or chief officer of customs with a copy thereof. The result would be a saving in the number of copies of certificates of inspection required, and the original copy could be furnished the master or owner of the vessel, which should always have been the practice. It is recommended that the law be amended in this respect.

CHANGE OF NAME OF SERVICE.

In his annual report for the fiscal year ended June 30, 1912, in speaking of the activities of the Steamboat-Inspection Service, the Supervising Inspector General points out how varied its work is. It now does more than inspect steam vessels, and therefore the name "Steamboat-Inspection Service" does not correctly describe the activities of the Service. It is recommended that the name of the Service be changed to Marine-Inspection Service.

SUPERVISING INSPECTOR GENERAL'S OFFICE.

The Supervising Inspector General, as required by law, gives his attention to the most important matter of obtaining uniform administration of the steamboat-inspection laws and the General Rules and Regulations passed by the Board of Supervising Inspectors. The central office does this in part by rulings, which are sent monthly to the Service and to the various interests of the merchant marine. It also publishes excerpts of letters to its inspectors in regard to matters that relate to the procedure of the Service, and in this way during the past year a greater uniformity has been obtained in the administration than ever before.

Uniformity of procedure is also obtained through the excellent card-index systems which have been installed in the Office of the Supervising Inspector General as well as in the offices of the local and supervising inspectors. For instance, to such an extent is there uniformity that it is possible for a clerk in the office of the local inspectors at New Orleans, La., to be transferred to the office of the local inspectors at New York, N. Y., and be familiar with the routine duties of that office. The matter of uniformity in clerical work, however, is really the least important. It is more important to obtain uniform inspection, and the Bureau obtains that result through its card system. To illustrate: Whenever a certificate of inspection of a vessel is issued, the local inspectors are required to file in their office a card entitled "Record of annual inspection" and forward a copy of that card to the Bureau at Washington. This card record of annual inspection contains data as to the name of the vessel, class and gross tonnage, the date inspection was completed, the local district in which inspected, the local district where previously inspected, the place where inspected, when hull was built, the date when same was rebuilt, the date when boilers were built, the date when boilers were rebuilt, the kind of service and the character of route, the number of passengers allowed, the number of officers and crew required, the name and address of owner, and detailed information in regard to the lifeboat equipment. With such a system the Bureau is in close and immediate touch with the local inspectors in the most outlying districts of the Service, and can by a careful examination of such cards ascertain whether inspectors are proceeding in the same manner at all places. When certificates of inspection are indorsed or amended, local inspectors are also required to furnish the central office with card reports setting forth the nature of such indorsement or amendment.

Whenever an officer's license is issued by the local inspectors, they are required to file in their office a card-form record of the license issued, copy of which is sent to the Bureau at Washington. This

enables the Bureau to have an alphabetical index of all persons receiving licenses from this Service. These cards contain information as to the name and address of any person licensed, whether naturalized or native, the class and grade of license, the location of the board of local inspectors issuing same, the date of issue and number of former license, the date and number of issue of the new license, and the waters for which license is issued; and as indorsements are made from time to time upon such a license local inspectors are required to file in their office a record of such indorsements and forward to the Bureau at Washington a copy of the card record of indorsement. Thus, as in the case of certificates of inspection, the Bureau at Washington is in intimate touch with all of the local inspectors and can ascertain if they are proceeding uniformly in all districts and are obeying the rules and regulations in regard to the issuing of licenses.

The Bureau requires local inspectors to submit reports of all casualties and violations of the steamboat-inspection laws, and it has a follow-up system by which it requires the inspectors to submit upon card forms the results of such investigations as they may conduct. The Bureau is able to ascertain through these casualty reports whether there is uniform administration in the matter of reporting violations and in taking necessary action incident thereto.

Local inspectors are required to file in their offices daily card records of work done, and to forward to the Bureau at Washington at the end of each day copies of these cards. By this method the Bureau is in close touch with the daily events in all the local districts.

The foregoing description of the card-index system of the Bureau shows the value of this system in obtaining uniform results. There is, however, not a sufficient number of clerks in the office at Washington to check these cards as rigorously as should be done. The Department has therefore asked for an additional clerk at \$900 per annum, and if this clerk is allowed by Congress it will be possible to check up closely the vessel-inspection, license, casualty, and daily cards that are now received, and thereby to correct errors which it can not at present take note of, because the clerks who file the cards have as much as they can do, in connection with their other duties, to see that certain important features are correct and to place the cards alphabetically in the cabinets.

BUREAU OF NAVIGATION.

TONNAGE OF THE MERCHANT MARINE.

The total documented merchant shipping of the United States on June 30, 1913, comprised 27,070 vessels of 7,886,518 gross tons. This is the largest tonnage in our history, and, excepting the British Empire, exceeds that of any other two nations combined. Of the total tonnage 1,027,776 gross tons were registered, showing the largest American tonnage for foreign trade in 27 years. Even more auspicious is the fact that over half of the year's increase was in tonnage for the foreign trade. Shipbuilding, too, prospered during the fiscal year, the output of our yards reaching 346,155 gross tons, an increase of 50 per cent over the previous 12 months. Under the Panama Canal act of August 24, 1912, the privilege of American registry is free to foreign-built ships not over 5 years old. The apprehension so long felt or simulated that free registry for the foreign trade would injure domestic industry has been dispelled, as after 10 months' experience under free registry we are better off than before the law was enacted and face a future of abundant promise. The difference in the cost of building vessels for the foreign trade in the United States and abroad has been largely eliminated, and in consequence we are a long step nearer a normal share in the world's ocean-carrying trade.

NAVIGATION RECEIPTS.

The receipts from tonnage duties last year were \$1,273,789.43, an increase of \$117,778.68 over the receipts for the previous year and the largest receipts from this source since 1884, when an annual duty of 30 cents per ton was levied. Tonnage duties are imposed without discrimination and are virtually on a minimum revenue basis, the rates in this country being substantially equivalent to corresponding charges imposed on vessels in British ports and materially less than the corresponding charges levied by the other principal nations of Europe. These rates were not changed by the tariff act of October 3, 1913.

Collections during the year of annual excise from foreign-built yachts owned by Americans, under section 37 of the tariff act of 1909, amounted to only \$492.84. The law was repealed by the tariff act of

October 3, 1913. The entire collections from the time it took effect, September 1, 1909, to June 30, 1913, amounted to \$68,619.21. The constitutionality of the law, it will be recalled, was disputed at the outset and the Supreme Court of the United States has not yet rendered a decision in the test cases. Excise amounting to upward of \$350,000 is involved in these cases, and in view of the repeal of the act the cases have been advanced on the calendar and the questions at issue will soon be determined.

SHIPPING COMMISSIONERS.

Shipping commissioners at 15 seaports shipped, reshipped, and discharged 379,188 seamen on American vessels during the past year, an increase of 4,405 over the previous year. The cost of the service was \$62,374.13, a reduction of \$999.40 compared with the previous year. The commissioner's office at Honolulu was abolished on July 7, 1912. When the Panama Canal is open it will undoubtedly be desirable to reestablish an office at this port, and if American shipping shall make such general use of the canal as is anticipated it will be necessary in another year to increase the clerical force of the shipping commissioners' offices at several seaports. Furthermore, the shipping commissioners are charged generally with the enforcement of the navigation laws in so far as they relate to seamen on merchant vessels, and the enactment into law of any of the several measures relating to seamen which have been considered by Congress in late years should be followed by appropriations to enable the Department to give effect to such legislation.

SAFETY AT SEA.

I have deemed it best in this report to make few specific recommendations on the subject of navigation, because so many large projects for the improvement by law of conditions on the sea are still indeterminate and under discussion here and abroad. The conclusions upon which we may agree with other nations are beginning to assume definite shape and soon may be expressed in the form of conventions and statutes.

The subject of safety of life at sea has been ever present for two years in the minds of Congress and of the Federal administration. The results of long and careful study of its problems, both at home and abroad, should be assembled at the coming session of Congress in legislation which will stand the test—the actual saving of life in time of peril. The time expended in study will not have been wasted if the legislation enacted shall embody the best thought and the highest attainable standards of the maritime powers.

On November 12, 1913, representatives of the 14 principal maritime nations met at London to consider the subject and to draft an inter-

national convention, which doubtless will be laid before Congress early in the coming year. It is promising for the success of that conference, indicative of the spirit which prompted its meeting, and will, I trust, guide its deliberations, that a month before it met steamships of the United States, England, Germany, France, and Russia, hurriedly called to rescue a burning ship in a storm, cooperated to avert calamity. The willingness to work together and to subordinate individual action in the interest of a common humanity, shown by the captains of the 10 steamships which rescued passengers and crew of the steamship *Volturno*, is not without its lesson to the Governments represented at London.

The Department has been hampered by lack of resources in making as thorough preparations for the conference as have been made by Great Britain, Germany, France, and possibly other nations. Last January the Senate Committee on Commerce and the House Committee on the Merchant Marine and Fisheries, charged with the consideration of matters affecting merchant shipping, were impressed with the importance of such preparations, and in joint session recommended an appropriation of \$10,000 to be immediately available for the purpose. To my regret the efforts of my predecessor and of myself to secure this appropriation failed. Accordingly, in May, with the cooperation of the heads of other Departments, I organized six committees, made up of officers of these Departments, to consider respectively the following subjects: Hulls and bulkheads; efficiency of officers and crews; aids and perils to navigation; lifeboats, davits, life rafts, and life preservers; fire protection, and radiotelegraphy. I take this occasion to thank the members of these committees for the time and study which they have devoted to the problems set before them.

On October 4 the President appointed 12 commissioners to represent the United States at the conference, selected in part from the membership of the committees mentioned, and I am confident that through this commission the views of the United States will be adequately and earnestly conveyed to the conference.

The conference is considering an extensive program. If it is able to embody its conclusions in an international convention, and if the Senate of the United States will advise and consent to its ratification, the largest amount of affirmative legislation on navigation matters which Congress has considered in many years must be framed and enacted. Among the many topics to be included will be the subdivision of the hulls of ocean-going passenger steamers into water-tight compartments and more exact regulations as to bulkheads. This will involve an extension of the powers of the Department, and if those powers are to be exercised and the will of Congress properly executed adequate appropriations must be made for the

purpose. So far as lifeboats and other life-saving appliances are concerned, the large grant of powers already bestowed upon the Department will probably prove ample, but I believe that Congress should vote the Department enough money to conduct inspections when needed other than at annual fixed periods. Adequate protection against fire has repeatedly been urged.

By the foresight of Congress the United States already has statutes in successful operation requiring apparatus and operators for radio communication on passenger and cargo steamers on the ocean and the Great Lakes, and there is reasonable probability that our legislation on this subject will be adopted in principle by nations generally. The value of wireless apparatus is undisputed and there can be no question of the need of maintaining a rigid and constant inspection of the apparatus and operators on American and foreign ships leaving our ports.

RADIO COMMUNICATION.

During the past fiscal year the duties of the Bureau of Navigation in respect to radio communication were greatly extended. By the act of July 23, 1912, ships required to carry wireless apparatus and operators under the act of 1910 were required also to carry an auxiliary power supply for emergency use in event of the failure of the ship's main power supply. In the three notable marine catastrophes of this autumn, the loss of the steamships *State of California*, *Templemore*, and *Volturmo*, it was necessary to resort to the auxiliary batteries, as the main engines of the ships became disabled. The inspection of the auxiliary apparatus has increased the work of the inspectors. The same act prescribed a constant watch with two operators on shipboard, where previously one only had been required. The act further prescribed means of constant communication between the watch officer on the bridge and the operator in the radio room. In addition, after April 1, 1913, the act became applicable to vessels on the Great Lakes, and since the beginning of the current fiscal year these several requirements have applied to cargo steamers with crews of 50 or over. The enforced use of wireless was so extended, indeed, that for a time the manufacturers of apparatus and the training schools for operators found difficulty in supplying demands created by the legislation.

The act of August 13, 1912, to regulate radio communication and to give effect to the Berlin Radiotelegraphic Convention, went into operation on December 13. Since that time the inspection force has been engaged in the examination and licensing of land stations in addition to its duties in respect to ships. Under the operation of these several laws the field radio service during the fiscal year 1913

made 3,201 inspections of ships and 715 inspections of land stations, and examined and licensed 1,427 radio operators. The service, which in 1911 was virtually confined to the seaports of New York, Baltimore, New Orleans, and San Francisco, has been extended, as far as 11 men can accomplish that result, to all the principal seaports and ports on the Great Lakes and to some of the principal interior centers of radio communication, and by two inspection trips the system of Federal supervision has been partially established in Hawaii and Porto Rico.

The expenses of the radio-inspection service for the past fiscal year were \$144.45 less than the appropriation of \$37,850. In the estimates for the coming year, I have asked for \$48,750—an amount barely sufficient to meet the necessities of the service and inadequate if by legislation its duties are to be increased over those now imposed on it. Wireless telegraphy has so conclusively demonstrated its value at sea, and its use ashore is extending so rapidly, that it requires no foresight to affirm that Congress will be called on hereafter to extend the inspection service.

LOAD-LINE CONFERENCE.

The tendency of modern commercial and industrial life to eliminate waste and reduce superfluous expenditure of effort is responsible in a large measure for the increasing demands for cooperation among nations. The results obtained by standardization in American industrial development are familiar. The aim of international conferences frequently is to establish standards in commerce which will insure fair terms of competition for all, economy of time and effort, and at the same time efficiency and safety. The depth, for example, to which an ocean cargo boat may be loaded with safety does not depend on the flag of the nation it flies. It is determined by natural laws. Unless there be agreement among nations that these laws shall be uniformly recognized, nations which observe them rigidly in the interest of safety may be on unequal terms of commercial competition with other nations less scrupulous about safety of life. The observance of different standards in different countries, furthermore, involves expenditure of time to no useful end. The appropriation of \$5,000 by Congress for American representation at the International Conference on Load Lines for Merchant Ships at London next spring will result in a direct commercial gain to our sea-borne commerce and an even more desirable improvement in the security of labor and capital employed in ocean transportation. The conclusions of the conference probably will not be available for the consideration of Congress at the next session, but any delay in action will be more than offset by the advantages from uniform action by maritime nations.

SHIPPING COMBINATIONS.

The Committee on the Merchant Marine and Fisheries, under resolution of the House of Representatives during the Sixty-second Congress, made a searching investigation into shipping combinations in the foreign as well as the coasting trade. The report and conclusions of the committee will speak with that authority which usually accompanies painstaking and impartial effort to establish definitely essential facts. The legislation which that committee doubtless will recommend will probably require considerable time and effort on the part of Congress. In recommending legislation on navigation matters in the name of the Department of Commerce I have kept in mind that part of the time which Congress can devote to these subjects already has been preempted for the consideration of legislation which will embody the matured conclusions of one of its own important committees.

ENFORCEMENT OF THE NAVIGATION LAWS.

The efforts of the Department to secure a thorough compliance on the water with the laws relating to the navigation and inspection of vessels were maintained throughout the year, except during the months of July and August before funds became available under the appropriation act. The fines, penalties, forfeitures, and costs involved in 3,506 cases of violations of various statutes considered by the Department amounted to \$31,987.85. The amount during the current fiscal year will be considerably larger. In meritorious cases the Department has considered all mitigating circumstances, and in cases of reasonable doubt the benefit has been given to the offender. At the same time the Department is aware that a critical public and press look to it to exact compliance with those conditions of security which Congress has aimed to promote by law. I believe that a sum equivalent to the penalties collected for violations of these laws should be set apart annually for the use of the Department in extending further its efforts to carry out these laws. For this reason the estimates for the current year carry an item of \$35,000, instead of \$15,000, which has been appropriated annually since 1910. Even this amount, I am confident, will be exceeded by the receipts from fines, penalties, and forfeitures under the policy pursued by the Department, and the service will therefore be self-sustaining.

With part of this proposed appropriation the Department will buy and operate a second vessel similar to the motor boat *Tarragon*, which has been most useful in enforcing the laws. The *Tarragon* was in commission 225 days during the fiscal year, visited 19 customs districts, inspected several thousand vessels, and reported 902 infractions

of the laws. The penalties incurred aggregated \$279,190, which the Department mitigated to \$5,504. The cost of operating the boat was \$7,743.20. It was thus nearly self-sustaining. During August and half of September, 1913, its officers reported 605 violations of law in New York Harbor and vicinity. The boat has been fitted with the best wireless apparatus devised by the Bureau of Standards and it has been instructed to visit between January and July, 1914, every port from Key West, Fla., to Eastport, Me.

The policy of the Department in fining offenders against the navigation laws is to mitigate the penalties to a nominal sum in cases of first offenses where the offenses have been unintentional. Experience shows that most boat owners are willing to comply with the law when its provisions are made clearly known to them in a courteous spirit. It is rarely necessary to exact a severe penalty, and only in cases where the violation of law has been deliberate or serious. Investigation shows a much fuller compliance with the requirements of law than has hitherto been the case and a much greater activity on the part of the local officers whose duty it is to enforce the navigation laws.

ADMEASUREMENT OF VESSELS.

It is important that our laws governing the measurement of vessels be revised at the coming session of Congress. This subject is somewhat complex, both on account of the technical details involved and of questions of general policy. At present the laws of the United States on this subject resemble closely the laws of Great Britain, Germany, and other maritime nations except as to the measurement of shelter decks and certain spaces for passengers constructed above the first deck not a deck to the hull. The rules for the measurement of vessels passing through the Panama Canal differ materially from the British and German rules and resemble closely the rules employed by the authorities of the Suez Canal. The new Panama rules increase appreciably the net tonnage of vessels, upon which most maritime charges are levied, above the net tonnage ascertained under the British and German rules. This increase is due primarily to the adoption of the so-called "Danube rule" for measuring propelling power spaces and to more rigid rules concerning shelter decks. It is well, therefore, to decide whether the general rules for the ports of the United States shall be brought into accord with new Panama rules or whether our American rules in the respects mentioned shall be more closely assimilated to the practice of Great Britain, Germany, and maritime nations generally. The former course will involve an increase in charges on shipping, American and foreign, in all phases of navigation throughout the

United States. The latter course will in some instances diminish those charges. The question does not materially affect the Federal revenue from tonnage taxes, which amounts to over \$1,200,000 annually. Any likely change in the rules would not increase or decrease this revenue by 10 per cent. The Federal charges on shipping are very light, however, by comparison with the charges which shipping is required to pay in foreign ports and with the various charges based on tonnage for State and local purposes and for private services rendered. The matter is now being carefully considered by the Department, and at a later day a bill embodying its views will be submitted to Congress.

ANCHORAGES.

The enactment of a law authorizing the Secretary of Commerce to define anchorage grounds for vessels in improved harbors and bays and to enforce the observance of regulations is recommended. The power requested is to be exercised only when maritime and commercial interests demonstrate that such regulation is required for safe navigation. The Secretary of Commerce now has this power for the harbors of New York and Chicago, and every year requests are made for the exercise of similar powers at other seaports, usually after an explosion or fire on shipboard has drawn attention to the lack of legislation on the subject.

In particular the attention of the Department has been drawn to the necessity of defining anchorage limits in Hampton Roads. Many hundreds of vessels arrive and leave these waters each month. Some lie in the Roads for days and even weeks. These ships have no designated anchorage grounds, and incoming and outgoing vessels must zigzag through this anchored fleet in daylight and darkness in all kinds of weather. Among these vessels are many important passenger steamers, carrying a monthly average of over 60,000 passengers. There is no semblance of a regulation as to where vessels shall anchor along the route covered by this commerce, for the harbor master's limits from Norfolk and Newport News do not extend to these waters. During the last 10 years many accidents have occurred in this locality from the above conditions.

The regulation of anchorages is general throughout the maritime world, and in the United States seems to be peculiarly a function of the Federal Government and especially of the Department of Commerce, which is charged with the execution of the laws relating to commerce and navigation. A bill such as is recommended passed the Senate in the last Congress, and I trust time will suffice for its favorable consideration by both branches of the present Congress.

DECK LOADS.

The transportation of deck loads of timber on the Atlantic, especially during the winter months, is attended with danger, and in the regulation of such transportation we have been backward. The loss of one of these cargo boats does not attract the notice which is aroused by the risks incurred by ocean passengers, but it is not to our credit that Great Britain and Canada should have shown more consideration for the lives of seamen engaged on such ships than we have done. Again, derelicts, which fill so large a place in the public eye, are almost always lumber-laden vessels, and our failure to regulate such deck loads contributes to the creation and maintenance of these menaces to navigation. The Department during the year has been in consultation with those on both sides of the Atlantic concerned in this subject, and a measure of relief will be prepared for the consideration of Congress at the coming session.

CONCLUSION.

Since any summary of the current work of the Department which included only a statement of its condition and procedure to the close of the fiscal year ended June 30, 1913, would be not only incomplete but inaccurate in giving a view of the actual existing conditions, I have ventured to enlarge this report sufficiently to indicate the plans for future work. These plans had their rise during the fiscal year covered by this report and may be esteemed a normal outgrowth of the work and the conditions to which the report technically refers. The separate reports of the several bureaus of the Department will give its work in detail and to them I must refer for a more complete discussion of the service the Department is endeavoring to render the public.

Respectfully,

WILLIAM C. REDFIELD,
Secretary.

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ANNUAL REPORT

DECEMBER

U.S. Dept. of Commerce

OF THE

SECRETARY OF COMMERCE

1914



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ANNUAL REPORT

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SECRETARY OF COMMERCE

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ANNUAL REPORT OF THE SECRETARY OF COMMERCE

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, November 10, 1914.

To the PRESIDENT:

I have the honor to submit herewith my second annual report, covering the operations and condition of the Department during the fiscal year ended June 30, 1914, and tracing in a general way its history through the month of October, 1914.

The organization of the Department was not changed during the fiscal year. The nine bureaus composing it during this period were those of Foreign and Domestic Commerce, Corporations, Standards, Census, Fisheries, Lighthouses, Coast and Geodetic Survey, Steamboat-Inspection Service, and Navigation. To these should be added the Office of the Secretary, consisting of five divisions, namely, Office of the Chief Clerk (including the Division of Supplies), Disbursing Office, Appointment Division, Division of Publications, and the Office of the Solicitor. By the act creating the Federal Trade Commission the Bureau of Corporations will be detached from the Department when that commission is organized and will form its administrative nucleus.

The hope expressed in my last report that the Bureau of the Census might be united with the rest of the Department by an addition to the Commerce Building has been carried into effect. Early in 1914 the Department made an informal agreement with the Commerce Building Co. for the construction of an 11-story and basement, steel-frame, fireproof addition to the present Commerce Building, at Nineteenth Street and Pennsylvania Avenue NW., in order to house the Bureau of the Census. The arrangement provided that the Department would, if the matter were approved by Congress, lease the addition at a rental of 40 cents per square foot, and that the building would be ready for occu-

pancy on or before September 1, 1914. Congress in the legislative, executive, and judicial act approved July 16, 1914, appropriated \$17,500 for the rent of the addition, which is at a rate not exceeding 35 cents per square foot, but authorized the leasing of the addition for a period of five years. The regular amount paid during the past nine years for rental for the Bureau of the Census has been \$21,000 per annum.

The construction of the addition began February 27, 1914, and the building was ready for occupancy on July 1, 1914. The Commerce Building Co. advised the Department on May 22 that the building would be ready for use on July 1, and the work of moving the Bureau of the Census began June 1. The large electric truck of the Bureau of Standards and that of the Bureau of the Census, with three wagons owned by the Department, were used to do most of the moving; some of the heavier hauling was performed by two local transfer companies. The appropriation of \$1,500 granted by Congress for moving the Bureau of the Census was not required and will be returned intact to the Treasury at the close of the present fiscal year.

By moving the Bureau of the Census into the enlarged Commerce Building, the Department was enabled to reduce its expenditures for the fiscal year ending June 30, 1915, by \$24,280. The change has also reduced the risk of the destruction by fire of valuable records of the Bureau, as the addition contains a fireproof vault in which these records are kept.

The Bureau of the Census is now housed with most of the other bureaus of the Department, and its officers and employees have expressed satisfaction with the improvement in their working conditions, particularly in the respects of light and ventilation. By the above-described change the Government is paying much less for greatly improved service. As a business proposition the scattering of a department through several buildings located in different parts of the city can never be justified. It is a cause of hourly waste, a producer of delays, and a creator of inefficiency. Only compelling reasons can warrant operating an organization which should be one whole through separate and distantly related parts.

There is a daily loss both of money and of effectiveness in the separation of the Bureau of Fisheries, the Bureau of Standards, and the Coast and Geodetic Survey from the rest of the Department. The work of the Bureau of Standards is such, however, as

to require that it be placed at a distance from the built-up portions of the city. No such condition affects the Coast and Geodetic Survey and the Bureau of Fisheries, one of which is near the Capitol and the other on the Mall, both so placed as to insure the maximum expense in operation and maintenance with the least efficiency in results. Furthermore, the buildings owned by the Government in which the Coast and Geodetic Survey and the Bureau of Fisheries are located are ill-adapted for their purposes. It would be hard to find two buildings worse suited for the uses to which they are put than these. Important work of the Coast and Geodetic Survey is conducted in what was an old stable, and the invaluable plates and records of the Survey are in constant danger from fire. Two small fires have already occurred and would have resulted in the destruction of the building if they had not been early discovered by accident. The building occupied by the Bureau of Fisheries was built as an armory for the militia of the District of Columbia in 1856. In 1878 it was a storehouse. In 1882 it was used for a fish hatchery. It has long been out of date. No private concern with an eye to economical management would permit the use of these buildings for their respective purposes longer than necessary for obtaining the funds to replace them.

I recommend that the proposed new Government building for the Department of Commerce be so planned that it shall contain the Coast and Geodetic Survey and the administrative portion of the Bureau of Fisheries.

The Bureau of Fisheries should be provided with a modern aquarium, suited alike for the education of the public and the carrying on of the scientific work of the Bureau. This should be housed in a separate building, located as near as practicable to the proposed new building for the Department.

Land has already been purchased by the Government for a building for the Department of Commerce and it would, in my judgment, be easy to revise the plans for the space intended at the time the plans were made for the bureaus since diverted into the Department of Labor, so that the building may receive, as above stated, the Fisheries and the Coast and Geodetic Survey, allowance at the same time being made for the removal of the Bureau of Corporations, which has been merged into the Federal Trade Commission. In this connection I renew my protest against the policy of paying rent to private parties for

buildings for the public service, especially when this requires the work of a great department to be split into separate parts at a greatly enhanced cost for operation. It is not good business sense to pay through rentals to private parties twice as high a rate of return on their investments as that which the Government would pay for money invested in buildings of its own.

The Department of Commerce occupies the Commerce Building under a lease with nearly four years to run. It would take substantially that time to complete the new structure and it would, in my judgment, be wise policy to proceed promptly with the latter. The site now occupied by the Coast and Geodetic Survey, of which a portion is occupied by the United States Public Health Service, is a valuable corner adjoining the Capitol, admirably suited for a building to be used in connection with the legislative branch but unfit for part of an executive department most of which is at the far end of the city. The union of all the bureaus of the Department into one efficient working whole is an end of primary importance to be sought so far as it is practicable to bring it about. It should be remembered that the Department has had experience in operating in separate scattered units and again in operating with six of its nine units gathered into one building. The knowledge thus gained points to the wisdom of grouping the whole Department together as nearly as possible under one roof at the earliest practicable time.

The act approved October 22, 1913, authorized the Secretary of Commerce to enter into a contract for the rental of a water-cooling plant in the Commerce Building, and such an apparatus has been installed. It consists of a refrigerating plant and pump located in the basement, with 51 fountains located throughout the building. This system gives general satisfaction and has enabled the Department to dispense with 75 water coolers.

In March, 1914, the Department purchased a light gasoline truck to carry mail between the post office, the Commerce Building, the Bureau of Fisheries, the Coast and Geodetic Survey, and the Bureau of the Census as then located, and to make miscellaneous trips to various departments, bureaus, and places of business. This work had till then required three horses and wagons and an electric truck, each with at least one employee and in some cases with two. Since the Bureau of the Census came to the Commerce Building the use of the electric truck of that Bureau has enabled the Department to dispense in all with four horses and wagons.

The gasoline truck has now been in operation six months. Its use has resulted in a direct saving in money and in quicker and better service.

This Department has turned over to the Department of Labor the following articles since November 5, 1913:

Article.	Number.	Value.	Article.	Number.	Value.
Key case.....	1	\$10.00	Halter and chain.....	1	\$1.90
Cuspidors.....	6	2.88	Scale, Buffalo drop-lever plat-		
Doors, swinging.....	20	275.80	form.....	1	37.75
Racks, towel.....	2	1.25	Ladders, trolley, suspension,		
Skid, truck.....	1	2.98	complete with track.....	2	32.00
Horse cover, storm.....	1	4.25	Ladders, trolley side, com-		
Horse blanket, night.....	1	5.00	plete with track.....	2	43.00
Surcingle.....	1	1.50	Brackets, fan.....	36	72.00
Storm apron for wagon.....	1	3.50	Shades, holophane, assorted,		
Nose bag.....	1	1.00	25 to 100 watts.....	247	186.26
Horse, bay.....	1	235.00	Fixtures, ceiling.....	20	382.00
Wagons, mail.....	2	375.00	Hoe, fire.....	1	1.60
Harness, single wagon, brass			Shovel, scoop.....	1	1.10
mounted.....	21	47.00	Extinguishers, fire.....	4	46.40
Blanket, street.....	1	4.00	Carpet.....	b 88½	147.96
Blanket, stable.....	1	6.40	Linoleum.....	b 860	1,087.90
Weight, hitching.....	1	.50			
			Total.....		3,012.93

a Set.

b Yards.

As furniture, equipment, etc., valued at \$9,489.84, were similarly transferred to the Office of the Secretary of Labor during the preceding fiscal year, the value of all such equipment transferred amounts to \$12,502.77.

The sundry civil act approved June 23, 1913, contained an appropriation of \$500,000 for the participation of the Government of the United States in the Panama-Pacific International Exposition at San Francisco, Cal., February 20 to December 4, 1915. The Government exhibit board, which is in charge of the Government exhibits, allotted \$54,625 for those of this Department. This sum was suballotted by the Department as follows:

Bureau of the Census.....	\$5,700
Bureau of Foreign and Domestic Commerce.....	950
Bureau of Standards.....	11,400
Bureau of Fisheries.....	25,650
Bureau of Lighthouses.....	4,750
Coast and Geodetic Survey.....	3,800
Bureau of Navigation.....	950
In reserve.....	1,425

The exhibits of the various bureaus are in preparation, and moving pictures have been taken of several features of the Department's work. This Department will make an attractive showing.

The cost of maintaining the Department of Commerce for the fiscal year ending June 30, 1914, including \$410,700.77 for printing and binding, was \$11,424,335.84. On June 30, 1914, there were turned into the surplus fund in the Treasury unused balances of appropriations amounting to \$347,162.48.

The force employed by the Department fluctuates greatly. At the close of the fiscal year there were employed, including all temporary and per diem services, 9,936 persons. This does not, however, represent the total number of persons who at one or another time were employed during the year. The total number of such employments throughout the fiscal year was 18,687.

The Department used the following vessels:

Coast and Geodetic Survey.....	12
Bureau of Navigation.....	1
Bureau of Lighthouses:	
Tenders.....	45
Light vessels.....	66
Bureau of Fisheries.....	9
Total.....	133

This is exclusive of 4 vessels loaned to the Coast and Geodetic Survey by the Philippine government and of 2 steam launches and 30 motor boats operated by the Bureau of Fisheries.

The services of the Department include surveying, charting, and lighting the Atlantic, Pacific, and Gulf coasts of the continental United States, the shores of Alaska, and the Aleutian Islands, Hawaii, and Porto Rico, lighting of the Great Lakes with their connecting rivers and other navigable streams, and surveying of the coasts of the Philippine Islands, their adjacent waters, and the shores of Guam and of Samoa.

The Bureau of Fisheries maintains 36 main and 94 auxiliary fish hatcheries and cultural stations and exercises supposed supervision over the salmon fisheries of Alaska and over the native community and the seal and fox herds on the Pribilof Islands, in the Bering Sea. As explained in my last report, the supervision exercised by the Bureau of Fisheries over the numerous salmon canneries and the fisheries along the Alaskan coast has been more alleged than real. The condition has been one admirably suited to a comic opera. Four salmon agents have been supposed, with-

out boats or other means of transit, to cover many thousand miles of coast, much of it without regular passenger lines. They have been forced, therefore, into the absurd position of calling upon the canneries which they were to inspect to lend them boats in order that they might reach the cannery to inspect it. This admirable example of "how not to do it" has been going on for years. On learning the facts Congress provided a fund of \$50,000 from which to secure vessels to provide proper means of transit for doing this work. When it shall furnish the men necessary, the ridiculous position that the Government has in this respect long occupied will cease to exist.

The Bureau of Standards has laboratories in Washington and Pittsburgh and has conducted cement testing through a special plant for that purpose located at Northampton, Pa. This great and fruitful service maintains close and increasing touch with State and municipal authorities and with industries all over the land. Its aid to other Government departments is invaluable.

The Coast and Geodetic Survey maintains, in addition to its extensive surveying and charting operations, magnetic observatories at Cheltenham Md.; Tucson, Ariz.; Vieques, P. R.; Sitka, Alaska; and Honolulu, Hawaii, and takes tidal observations at regular stations in Maine, New York, New Jersey, Pennsylvania, Maryland, Florida, Texas, California, Washington, and Alaska.

This Survey is the oldest scientific service of the Government. It is also the greatest of its kind in the world, and the efficiency of its work is as marked as its extent; it is so recognized by other nations. Its methods and standards are approved by all who have accurate knowledge of the subject. There are single features of its work which are greater than the combined services of a similar nature of like departments in other great nations. Comparison, for example, of the tremendous task of surveying and charting the coasts of Alaska and the Aleutian Islands with that involved in the coast surveys of France or Great Britain will show to anyone the burden which this service so ably bears. Its duties in the Philippine Islands are of greater extent and importance, alike locally, nationally, and internationally, than are those of the entire like service of many another great nation.

The duty of the Coast Survey deals first with humanity and second with commerce. Its work comes foremost in the protection of life and property along our shores and in opening the way for trade; yet after an experience of 20 months I affirm, without

fear of successful contradiction, that the past attitude of the Government toward the Coast and Geodetic Survey, if the magnitude of its task be considered and the quality of its work be weighed, has been both with respect to its housing, its vessels, and to the necessary apparatus for its serious tasks, and particularly as regards the Pacific coast and Alaska, like that of a wealthy and prosperous man refusing to give to his loyal children the necessities of life.

I speak of this in detail later. It is thus placed in the forefront of my report and with intended emphasis that this Department may not have upon its conscience and its record the responsibility for the loss of human life and property that has ensued from penuriousness respecting this service in the past and will ensue unless this policy is changed.

These are strong words. They are amply justified. Their truth can not be successfully challenged. Our citizens have been drowned (31 in one case) and both private and public property repeatedly lost because the United States Government has not more rapidly provided the force and apparatus with which to survey and chart the dangerous waters of our Pacific and particularly of our Alaskan coast.

The Bureau of Foreign and Domestic Commerce has in operation offices in New York, Chicago, San Francisco, New Orleans, Boston, Atlanta, Seattle, and St. Louis. None of these was in existence when the present administration took charge. They have been established to bring the services of this great Bureau closer to the business public. They have met with a welcome that has been embarrassing in its extent. Other cities, among them Pittsburgh, Detroit, and Baltimore, have applied to have similar offices established in them. The Department earnestly desires to extend this service and will do so as fast as funds are provided.

The Bureau of Navigation enforces the navigation laws of the United States along the Atlantic coast and in the rivers and harbors connected therewith. It acknowledges with thanks the efficient aid of the Steamboat-Inspection Service, of the Revenue-Cutter Service, and of the customs collectors in this important work, the details of which are given later.

The Steamboat-Inspection Service was never more effective than now, and steadily gains in efficiency. It is manned with an admirable staff, showing a fine professional spirit, keenly conscious of the importance of its duty in safeguarding life and property, doing its work with firmness and with tact.

The Bureau of the Census is for the first time properly housed. Its invaluable records are for the first time safeguarded against fire. It has completed the inherited work of the Thirteenth Census and is taking up the census of manufactures, soon to be taken as of December 31, 1914, in an enthusiastic spirit, with effective methods. It looks forward to the agricultural census to be taken under the act of July 2, 1909, as a further opportunity for improved service.

The Bureau of Lighthouses is the greatest organization of its kind and is maintained at a high standard. Through the liberality of Congress and by careful economy of funds it has been found possible for the first time to equip a number of its seagoing tenders with wireless apparatus and to bring the wages paid to its seamen upon the Atlantic coast a little more in harmony with those paid by other Government services and by private parties. Both measures tend directly to cheaper and better service. The wise provision by Congress of \$60,000 in an appropriation for aids to navigation in Alaska has permitted the taking of prompt steps for marking known dangers in those waters. Before, however, the coast of Alaska can be properly marked a vessel of sufficient size to keep the sea and do its work in rough weather must be provided. A former tender in Alaskan waters was wrecked upon an unknown rock. This was a needless waste of property, but there have been many more like it in those waters. Legislation is now pending to provide a suitable vessel.

It is with regret that as this report is written we are preparing to part with the Bureau of Corporations, which becomes the nucleus of the new Federal Trade Commission. That Bureau has been one of the valuable adjuncts of the Department. Its work has been done well but without excitement or the spirit of self-advertising. It has been a privilege to be associated with its staff, from its head downward, and the experience derived from pleasant personal association in a common work affords a sound basis for belief in the success of that service in its enlarged field.

The above survey is both brief and partial but gives a glance at the extent of the Department's work. The operations of each bureau are separately considered later.

The appropriations for the current fiscal year (ending June 30, 1915) provide for the use of the Department the sum of \$11,689,829.05. The estimates for the fiscal year ending June 30, 1916, including \$430,000 for printing and binding and exclud-

ing \$1,831,900 not directly estimated for public works for the Lighthouse Service, total \$17,201,095, an increase of \$5,511,265.95 over the appropriations for 1915.

The largest single item in the increased fund requested is the necessary provision for the census of agriculture, which is by law required to be taken in the year 1915 as of October 1. The sum required for this work is \$3,103,500. Another considerable item is the renewed request on behalf of the Coast and Geodetic Survey for three new vessels for Alaska and three small vessels (large launches) for wire-drag work and resurveys on the Atlantic coast. The statements made in my last report upon this subject are reaffirmed and are emphasized by the recent loss of the United States revenue cutter *Tahoma*, one further sacrifice to the uncharted dangers of Alaskan waters. Such sacrifices must and will continue until we deal with this problem as its importance requires. The subject is treated fully under the heading of the Coast and Geodetic Survey.

The plan for reorganizing and strengthening the Bureau of Foreign and Domestic Commerce, to which attention was given in detail in my last annual report, has been developed actively during the fiscal year 1914. Through the helpful action of Congress this important branch of the Department is now much more adequately equipped for useful and effective trade-promotion service than ever before. A number of new positions have been provided to reinforce the central office in Washington, and increased appropriations for the field service, both at home and abroad, are now available.

The United States is one of the three foremost commercial nations. It is essential to its prosperity that it should be inferior to no other country in its governmental system for the fostering and protection of its trade, both domestic and foreign. Such a system is now firmly established. In foreign countries the admirable trade-development work which the consular officers of the Department of State carry on is now to be supplemented through the service of a corps of commercial attachés, which will fill a gap heretofore existing in our organization as compared with that of other nations. These, with the group of special traveling investigators or commercial agents who continue the valuable technical studies of markets abroad, constitute for the first time in the foreign field a complete and well-balanced system of Federal aid to trade in foreign lands.

The country is to be congratulated that under existing conditions it has by the wise liberality of Congress provided dur-

ing the past year not only with a well-rounded system of obtaining information abroad but with another for utilizing that information at home. The matter is treated in detail under the heading of the Bureau.

It is a pleasure to acknowledge the support of Congress in dealing with certain suggestions in my last report, and it is my belief that even more would have been done had Congress realized the exact facts. The American people do not, in my belief, understand that their Government is obliged for lack of money to buy old, secondhand vessels and use them in dangerous waters, at a high cost for repair and for services for which they were not designed. Neither the American people nor Congress desire that lives shall continue to be sacrificed when measures can be taken which will stop the sacrifice at trifling cost. In my belief, both Congress and the American people are willing to spend for needful work well done whatever that work requires for its reasonable performance. It is in this spirit that I shall lay before Congress again the estimates for this Department for the coming fiscal year.

There is so much talk about governmental extravagance that the people hardly understand that some of their services are run upon a basis that it would be lavish to call frugal. They do not want their officers who must stay at sea to be obliged to eat and sleep and wash in the same room as they are now obliged to do. They are just as anxious that their seamen shall have sufficient room and air in which to sleep as they are that their children shall be provided with air in schoolhouses. It has been suggested as perhaps a kindly criticism of administrative officers that they are properly enthusiastic over their own work, but no such disclaimer will do away with hard facts. When a steamer must do work at sea that has not sufficient power for steerageway in heavy weather, the risk and the responsibility can not lie upon this Department, but must rest with those to whom, when the facts are plainly stated, is given the honorable duty of providing funds that such conditions shall no longer exist.

Under the supervision of the Chief Clerk and Superintendent, the libraries formerly maintained by the several bureaus when separated have been consolidated. The library of the Bureau of the Census was the last one to be made a part of the general library, and the librarian of that Bureau has been placed in charge. The consolidation has already resulted in greater efficiency, and will save money by dispensing with the purchase of many duplicate copies of books and periodicals and with the

binding of duplicate copies of foreign publications, which was necessary when the various bureaus maintained separate libraries.

The Department has dispensed with the telegraph office formerly maintained by the Bureau of the Census. The telegraphic business of that Bureau is now handled in conjunction with the work of the general telegraph office of the Department. In like manner the private telephone exchange formerly maintained by the Bureau of the Census has been discontinued and its service consolidated with the Department switchboard. Through this action five distinct telephone lines and an operator have been saved.

In consolidating the carpenter shop formerly maintained by the Bureau of the Census, there was transferred to the carpenter shop of the Bureau of Standards machinery and equipment valued at approximately \$2,420 which it would otherwise have been necessary for the latter Bureau to purchase.

About 3 miles in length (15,265 linear feet) of dilapidated wooden shelving which was in use throughout the Department has been replaced with steel shelving. The Bureau of Foreign and Domestic Commerce has been furnished with steel vertical letter units.

The Department purchased during the fiscal year 132 typewriters, 99 for use in the District of Columbia and 33 for outside service. The total cost of these was \$9,357.40. The allowance for old machines given in exchange was \$2,827, making a net cash outlay for new machines of \$6,530.40, an average net cash price of \$49.47 paid for each machine.

The stable equipment of the Department formerly consisted of 11 horses, 5 wagons, 4 carriages, 1 runabout, 1 omnibus, and an electric truck. Through the union of the Department in one building this equipment has been gradually reduced so that the Department has now, in addition to the gasoline truck previously mentioned, but 5 horses, 4 carriages, 1 wagon, 1 omnibus, and 1 electric truck. This will be further reduced as soon as a new gasoline truck is delivered, for which an order has been placed, by 1 horse, 1 wagon, 1 omnibus, and the electric truck, which is nearly worn out. Coincident with this has been a reduction of rent for stable purposes from \$1,800 to \$1,000 per annum.

A special departmental messenger and mail service has been established between the Commerce Building, the Capitol, the several executive departments, and the Government Printing Office. All urgent mail from the various offices in the building is sent to the mail room on the first floor, where it is collected for delivery by special messengers, who leave the building every hour during the day.

Arrangements have been made for serving coffee and hot lunches on the third, sixth, and ninth floors of the Commerce Building during the luncheon period; and to avoid congestion in the halls and to serve the convenience of employees the office hours for the Bureau of the Census have been fixed at from 8.45 a. m. to 4.15 p. m., and those for other employees at from 9 a. m. to 4.30 p. m.

Appropriations and Expenditures.

The itemized statement of the disbursements from the contingent fund of the Department of Commerce and the appropriation for "General expenses, Bureau of Standards," for the fiscal year ended June 30, 1914, required to be submitted to Congress by section 193 of the Revised Statutes of the United States; the itemized statement of expenditures under all appropriations for propagation of food fishes during the fiscal year ended June 30, 1914, required by the act of Congress approved March 3, 1887 (24 Stat., 523); and a statement showing travel on official business by officers and employees (other than the special agents, inspectors, and employees in the discharge of their regular duties, who are required to travel constantly) from Washington to points outside of the District of Columbia during the fiscal year ended June 30, 1914, as required by the act of Congress approved May 22, 1908 (35 Stat., 244), will be transmitted to Congress in the usual form.

The following table shows the total amounts of all appropriations for the various bureaus and services of the Department of Commerce for the fiscal year ended June 30, 1914:

Bureau.	Legislative act.	Sundry civil act.	Deficiency act.	Special acts.	Total.
Office of the Secretary.....	\$ 881,480.00		\$6,562.68		\$888,042.68
Bureau of Corporations.....	253,300.00				253,300.00
Bureau of Lighthouses.....	64,510.00	\$5,007,420.00	724,985.69		5,796,915.69
Bureau of the Census.....	1,122,320.00		2,500.00		1,125,320.00
Bureau of Foreign and Domestic Commerce.....	174,860.00		50,000.00		224,860.00
Steamboat-Inspection Service.....	534,740.00		8,000.20		542,740.20
Bureau of Navigation.....	160,510.00			\$5,402.79	165,912.79
Bureau of Standards.....	555,940.00	45,000.00	2,000.74		602,940.74
Coast and Geodetic Survey.....		1,024,420.00	2.44		1,024,422.44
Bureau of Fisheries.....		1,087,180.00	2.50		1,087,182.50
Allotment for printing and binding.....		\$ 525,000.00			\$ 525,000.00
Total.....	3,148,110.00	7,609,000.00	794,052.85	5,402.79	11,656,665.64

* Of this amount, \$20,497.50 was transferred to the Department of Labor.

† Of this amount, \$24,000 was transferred to the Department of Labor.

The disbursements by the Disbursing Clerk of the Department of Commerce during the fiscal year ended June 30, 1915, accounted according to items of appropriation, are as follows:

OFFICE OF THE SECRETARY

Salaries, Office of Secretary of Commerce, 1913	\$2, 132. 65
Salaries, Office of Secretary of Commerce, 1914	139, 109. 22
Unfunded expenses, Department of Commerce and Labor, 1913 ..	21. 53
Unfunded expenses, Department of Commerce, 1913	27, 095. 08
Unfunded expenses, Department of Commerce, 1914	65, 792. 90
Travel, Department of Commerce, 1913	4, 111. 56
Travel, Department of Commerce, 1914	51, 902. 73
Total	204, 782. 15

BUREAU OF CORPORATIONS

Salaries, Bureau of Corporations, 1913	3, 132. 12
Salaries, Bureau of Corporations, 1914	70, 296. 03
Salaries and expenses, special attorneys, Bureau of Corporations, 1913 ..	1. 00
Salaries and expenses, special attorneys, Bureau of Corporations, 1914 ..	6, 435. 11
Salaries and expenses, special attorneys, Bureau of Corporations, 1914 ..	136, 195. 11
Total	216, 077. 37

BUREAU OF FOREIGN AND DOMESTIC COMMERCE

Salaries, Bureau of Foreign and Domestic Commerce, 1913	4, 366. 85
Salaries, Bureau of Foreign and Domestic Commerce, 1914	98, 931. 23
Classifying tariffs of foreign countries, 1913	443. 90
Classifying tariffs of foreign countries, 1914	9, 040. 94
Bundling commerce, Department of Commerce, 1913	3, 273. 96
Bundling commerce, Department of Commerce, 1914	20, 959. 67
Investigating cost of production, Department of Commerce, 1914	29, 079. 68
Payment to Juan de Olivares (deficiency act approved June 25, 1910) ..	13. 69
Total	166, 109. 90

BUREAU OF STANDARDS

Salaries, Bureau of Standards, 1913	9, 707. 99
Salaries, Bureau of Standards, 1914	258, 550. 87
Salaries, Bureau of Standards	25, 911. 74
Equipment, Bureau of Standards, 1912	16. 56
Equipment, Bureau of Standards, 1913	18, 993. 79
Equipment, Bureau of Standards, 1914	56, 759. 89
General expenses, Bureau of Standards, 1913	71. 29
General expenses, Bureau of Standards, 1913	3, 271. 58
General expenses, Bureau of Standards, 1914	19, 474. 91
Investigating effects of electric currents, Bureau of Standards, 1912	70. 20
Investigating effects of electric currents, Bureau of Standards, 1913	824. 45
Testing machines, Bureau of Standards, 1913	4, 138. 21
Testing machines, Bureau of Standards, 1914	24, 193. 46
Testing structural materials, Bureau of Standards, 1913	1. 25
Testing structural materials, Bureau of Standards, 1913	5, 808. 02
Testing structural materials, Bureau of Standards, 1914	69, 072. 97

Improvement and care of grounds, Bureau of Standards, 1913.....	\$401. 09
Improvement and care of grounds, Bureau of Standards, 1914.....	2, 888. 27
Refrigeration constants, Bureau of Standards, 1913.....	4, 994. 69
Refrigeration constants, Bureau of Standards, 1914.....	11, 466. 73
Current meter testing tank, Bureau of Standards, 1913.....	3, 694. 05
Electrical laboratory equipment, Bureau of Standards, 1913-14.....	22, 777. 17
High-potential investigations, Bureau of Standards, 1914.....	13, 756. 54
Testing railroad scales, Bureau of Standards, 1914.....	18, 573. 56
Investigation of fire-resisting properties, Bureau of Standards, 1914.....	8, 408. 54
Workshop and storehouse, Bureau of Standards.....	19, 578. 77
Total.....	603, 406. 59

BUREAU OF NAVIGATION.

Salaries, Bureau of Navigation, 1913.....	1, 335. 87
Salaries, Bureau of Navigation, 1914.....	31, 615. 79
Salaries, Shipping Service, 1913.....	2, 481. 03
Salaries, Shipping Service, 1914.....	26, 668. 48
Clerk hire, Shipping Service, 1913.....	2, 919. 00
Clerk hire, Shipping Service, 1914.....	31, 489. 18
Contingent expenses, Shipping Service, 1913.....	1, 650. 80
Contingent expenses, Shipping Service, 1914.....	5, 198. 38
Enforcement of navigation laws, 1913.....	4, 745. 12
Enforcement of navigation laws, 1914.....	13, 666. 24
Enforcement of wireless-communication laws, 1913.....	9, 737. 31
Enforcement of wireless-communication laws, 1914.....	34, 065. 80
Admeasurement of vessels, 1914.....	1, 723. 27
Total.....	167, 296. 27

STEAMBOAT-INSPECTION SERVICE.

Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1913.....	610. 03
Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1914.....	13, 884. 98
Salaries, Steamboat-Inspection Service, 1913.....	28, 502. 29
Salaries, Steamboat-Inspection Service, 1914.....	315, 256. 57
Clerk hire, Steamboat-Inspection Service, 1913.....	6, 880. 10
Clerk hire, Steamboat-Inspection Service, 1914.....	75, 550. 77
Contingent expenses, Steamboat-Inspection Service (no year).....	. 20
Contingent expenses, Steamboat-Inspection Service, 1912.....	2. 26
Contingent expenses, Steamboat-Inspection Service, 1913.....	11, 650. 29
Contingent expenses, Steamboat-Inspection Service, 1914.....	66, 040. 56
Steamboat-Inspection Service, Los Angeles, Cal., 1914.....	4, 008. 29
Total.....	522, 386. 34

BUREAU OF FISHERIES.

Salaries, Bureau of Fisheries, 1913.....	29, 338. 58
Salaries, Bureau of Fisheries, 1914.....	340, 775. 71
Miscellaneous expenses, Bureau of Fisheries, 1912.....	43. 40
Miscellaneous expenses, Bureau of Fisheries, 1913.....	61, 142. 34

Miscellaneous expenses, Bureau of Fisheries, 1914.....	\$378, 636. 48
Protecting seal fisheries of Alaska.....	1, 481. 37
Protecting seal and salmon fisheries of Alaska, 1913.....	3, 520. 04
Protecting seal and salmon fisheries of Alaska, 1913-14.....	35, 688. 98
Protecting seal and salmon fisheries of Alaska, 1914.....	26, 360. 15
Biological station, Mississippi River Valley.....	5, 886. 35
Marine biological station, Florida.....	543. 35
Steamer <i>Albatross</i> , repairs, 1914.....	39, 283. 00
Payment to Great Britain and Japan.....	20, 000. 00
Distribution cars, Bureau of Fisheries, 1914.....	63. 73
Philippine fisheries report.....	642. 30
Fish hatcheries:	
Green Lake, Me.....	504. 28
Kentucky.....	17, 108. 67
Puget Sound, Wash.....	7, 875. 38
South Carolina.....	18, 167. 24
Upper Mississippi Valley.....	6, 807. 19
Utah.....	289. 40
West Virginia.....	795. 00
Wyoming.....	267. 75
Total.....	995, 220. 69

BUREAU OF THE CENSUS.

Salaries, Bureau of the Census, 1913.....	28, 762. 46
Salaries, Bureau of the Census, 1914.....	664, 022. 85
Collecting statistics, Bureau of the Census, 1913.....	10, 959. 81
Collecting statistics, Bureau of the Census, 1914.....	361, 907. 13
Cotton statistics, Bureau of the Census, 1913.....	13. 75
Rent, Bureau of the Census, 1913.....	1, 750. 00
Rent, Bureau of the Census, 1914.....	19, 250. 00
Tabulating machines, Bureau of the Census, 1913.....	736. 74
Tabulating machines, Bureau of the Census, 1914.....	10, 764. 73
Temporary clerks, Bureau of the Census, 1913.....	8, 086. 67
Expenses of the Thirteenth Census, 1910-12.....	175. 50
Tobacco statistics, Bureau of the Census, 1914.....	1, 841. 44
Total.....	1, 108, 271. 08

BUREAU OF LIGHTHOUSES.

Salaries, Bureau of Lighthouses, 1913.....	2, 787. 64
Salaries, Bureau of Lighthouses, 1914.....	60, 102. 01
General expenses, Lighthouse Service, 1912.....	6, 497. 12
General expenses, Lighthouse Service, 1913.....	26, 327. 39
General expenses, Lighthouse Service, 1914.....	48, 753. 61
Salaries, Lighthouse Service, 1913.....	287. 50
Salaries, Lighthouse Service, 1914.....	10, 616. 67
Salaries, lighthouse vessels, 1914.....	18, 849. 92
Salaries, lighthouse vessels, 1912.....	6. 67
Salaries, keepers of lighthouses, 1914.....	19, 828. 24
Aids to navigation, St. Marys River, Mich.....	27, 000. 00
Fort McHenry Channel Range Lights, Md.....	28, 228. 41
Sand Island Light Station, Ala.....	13, 135. 49
Thimble Shoal Light Station, Va.....	39, 927. 11
Tender for first lighthouse district.....	1, 077. 07

Tender for fifteenth lighthouse district.....	\$18, 530. 22
Tender for engineer, third lighthouse district.....	287. 71
Tender for engineer, sixth lighthouse district.....	715. 00
Point Abino Light Vessel, Lake Erie.....	51, 146. 28
Light vessels for general service.....	51, 625. 78
Oil houses for light stations.....	160. 60
Lighting Norfolk Harbor, Va.....	12, 663. 70
Detroit River lights, Mich.....	29, 641. 60
Brandywine Shoal Light Station, Del.....	41, 910. 00
Buffalo Breakwater, North End Light Station, N. Y.....	6, 335. 00
Kauai Island Light Station, Hawaii.....	288. 24
Cape Fear River lights, N. C.....	22, 521. 40
Southwest Pass Light Vessel, Mississippi River, La.....	150. 00
Total.....	<u>539, 400. 38</u>
Grand total.....	<u>4, 612, 952. 77</u>

The following statement shows the expenditures during the fiscal year ended June 30, 1914, on account of all appropriations under the control of the Department, giving the total amounts disbursed by the various disbursing officers of the Department and miscellaneous receipts for the same period:

By the Disbursing Clerk, Department of Commerce, on account of salaries and expenses of the Office of the Secretary of Commerce, the Bureaus of Corporations, Foreign and Domestic Commerce, Navigation, Standards, Fisheries, and Lighthouses, the Office of the Supervising Inspector General, Steamboat-Inspection Service, salaries and expenses of Steamboat-Inspection Service at large, and public works of the Lighthouse and Fisheries Services (shown in detail in the foregoing table of disbursements).....	\$4, 612, 952. 77
By the authorized disbursing officers of the Lighthouse Service.....	4, 943, 710. 37
By the special disbursing agent, Coast and Geodetic Survey, on account of salaries and expenses of the Coast and Geodetic Survey.....	991, 271. 48
By the commercial agents of the Department investigating trade conditions abroad, as special disbursing agents.....	47, 840. 54
By special disbursing agents, Bureau of Fisheries.....	30, 371. 69
By warrants drawn on the Treasurer of the United States to satisfy accounts settled by the Auditor for the State and Other Departments, classified as follows:	
Office of the Secretary.....	\$296. 85
Bureau of Corporations.....	22. 15
Foreign and Domestic Commerce.....	2, 431. 19
Bureau of Standards.....	3, 676. 41
Steamboat-Inspection Service.....	125. 14
Bureau of Navigation.....	6, 403. 60
Bureau of Fisheries.....	8, 772. 17
Bureau of the Census.....	123, 400. 54
Bureau of Lighthouses.....	206, 458. 54
Coast and Geodetic Survey.....	<u>35, 901. 63</u>
Printing and binding.....	<u>387, 488. 22</u>
Total.....	<u>11, 424, 335. 84</u>

MISCELLANEOUS RECEIPTS, FISCAL YEAR 1914.

Coast and Geodetic Survey: Sale of Charts, Tide Tables, etc.	\$20,951.57
Bureau of Standards: Standardizing and testing weights, etc.	8,158.37
Bureau of Navigation:	
Navigation lines	40,741.38
Navigation lots	152,694.19
Bureau of Fisheries:	
Sale of seal skins	51,567.61
Sale of fox skins	17,175.00
Treasury settlements	3,780.04
Bureau of Lighthouses: Treasury settlements	3,893.93
Proceeds of sale of condemned property, etc., by the Department	24,919.28
Total	323,881.37
Other receipts:	
Annual yacht tax	446,870.50
Tonnage tax	1,310,759.03
Grand total	2,081,510.90

The following unexpended balances of appropriations were turned into the surplus fund June 30, 1914, in accordance with the act of June 20, 1874 (18 Stat., 110-111):

Salaries, Office of Secretary of Commerce and Labor, 1912	\$2,725.15
Salaries and expenses, commercial agents, Department of Commerce and Labor, 1911	6.45
Salaries and expenses, commercial agents, Department of Commerce and Labor, 1912	7,220.33
Rent, Department of Commerce and Labor, 1910	1.25
Rent, Department of Commerce and Labor, 1912	2,404.61
Contingent expenses, Department of Commerce and Labor, 1912	5,699.10
Salaries, Bureau of Corporations, 1912	5,081.48
Salaries and expenses, special attorneys, etc., Bureau of Corporations, 1912	39,987.81
Expenses of the Thirteenth Census, 1910-12	626.92
Salaries, Bureau of Manufactures, 1912	316.00
Salaries, Bureau of Statistics, 1912	365.56
Collecting statistics relating to commerce, 1912	197.43
Collating tariffs of foreign countries, 1912	758.96
Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1912	132.78
Salaries, Steamboat-Inspection Service, 1912	2,544.60
Clerk hire, Steamboat-Inspection Service, 1912	815.35
Contingent expenses, Steamboat-Inspection Service, 1912	10,100.67
Salaries, Bureau of Navigation, 1912	731.93
Salaries, Shipping Service, 1912	1,308.16
Clerk hire, Shipping Service, 1912	218.31
Contingent expenses, Shipping Service, 1912	538.36
Instruments for measuring vessels and counting passengers, 1912	301.14
Enforcement of navigation laws, 1912	204.19
Enforcement of wireless communication laws, 1912	39.81
Salaries, Bureau of Standards, 1912	12,289.04
Equipment, Bureau of Standards, 1912	1,440.61
General expenses, Bureau of Standards, 1912	403.82

Improvement and care of grounds, Bureau of Standards, 1912.....	\$107. 07
Investigating effects of electric currents, Bureau of Standards, 1912.....	122. 69
Testing machines, Bureau of Standards, 1912.....	222. 08
Testing structural materials, Bureau of Standards, 1912.....	70. 33
Salaries, Coast and Geodetic Survey, 1912.....	4, 475. 47
Party expenses, Coast and Geodetic Survey, 1911-12.....	13, 227. 65
Party expenses, Coast and Geodetic Survey, 1912.....	5, 138. 91
General expenses, Coast and Geodetic Survey, 1912.....	502. 59
Pay, etc., of officers and men, vessels, Coast Survey, 1912.....	22, 447. 42
Repairs of vessels, Coast Survey, 1912.....	920. 50
Salaries, Bureau of Lighthouses, 1912.....	701. 65
General expenses, Lighthouse Service, 1912.....	21, 827. 13
Salaries, keepers of lighthouses, 1912.....	16, 001. 56
Salaries, lighthouse vessels, 1912.....	70, 354. 45
Salaries, Lighthouse Service, 1912.....	26, 081. 22
Expenses of buoyage, 1911.....	248. 63
Expenses of light vessels, 1911.....	108. 20
Edgemoor lighthouse depot, Del.....	31. 57
Bogue Sound Range Light, N. C.....	234. 31
Frying Pan Shoal Light Vessel, N. C.....	10, 860. 38
Sand Island Light Station, Ala.....	791. 16
North Point Light Station, Wis.....	417. 85
Barge for lighthouse depot, St. Joseph, Mich., 1911-12.....	7, 000. 00
Point Loma Light Station, Cal.....	50. 14
San Pedro Breakwater Light Station, Cal.....	635. 55
Battery Point fog signal, Wash.....	363. 52
Relief light vessel for ninth and eleventh lighthouse districts.....	194. 40
Salaries, Bureau of Fisheries, 1912.....	13, 352. 07
Miscellaneous expenses, Bureau of Fisheries, 1912.....	19, 367. 95
Protecting seal and salmon fisheries of Alaska, 1911-12.....	2, 216. 59
Protecting the sponge fisheries, 1912.....	4, 800. 60
Biological station, Mississippi River Valley.....	268. 16
Marine biological station, North Carolina.....	1. 78
Fish hatchery, Green Lake, Me.....	449. 26
Fish hatchery, West Virginia.....	17. 03
Steam vessel for Alaska.....	7, 000. 00
Steamer <i>Fish Hawk</i> , repairs.....	92. 85
Total.....	347, 162. 48

Personnel.

The creation of the Department of Labor had the effect of taking away from the Appointment Division the general supervision over the appointment work of a personnel consisting of 1,827 employees. This caused a small reduction in the force of the Division, which reduction has been partly met, however, by the transfer to the Secretary's roll of employees who had been serving by detail from the Bureau of the Census. The net reduction in the salary roll at the close of the fiscal year amounted to \$2,340, with no details from the various bureaus. The increasing demands for information, the frequent changes in the personnel, and the adop-

tion of additional safeguards designed to protect the Government's interests more than counterbalance any saving which has been effected by the introduction of improved and more economical methods of operation.

The accompanying table shows by bureaus the number of permanent positions in the Department on July 1, 1914, and the increase or decrease in each bureau as compared with July 1, 1913. The figures do not include temporary appointments, nor do they include the following appointments or employments not made by the head of the Department: Persons engaged in rodding, chaining, recording, heliotroping, etc., in field parties of the Coast and Geodetic Survey; temporary employments in field operations of the Bureau of Fisheries; mechanics, skilled tradesmen, and laborers employed under authority of Schedule A, Subdivision I, section 12, of the civil-service rules in the Lighthouse Service. Enlisted men on vessels of the Coast Survey in the Philippines, paid by the insular government of the Philippine Islands, are also excluded. The total of these excluded miscellaneous employments and enlistments is approximately 9,482.

Bureau	Statutory.	Non-statutory.	Total.	In District of Columbia.	Outside District of Columbia.	Increase (+) or decrease (-).
Office of the Secretary.....	126	.....	126	126	.....	- 13
Bureau of the Census.....	621	756	1,377	640	737	+ 1
Bureau of Corporations.....	63	70	133	133	.....	+ 6
Bureau of Foreign and Domestic Commerce.....	83	37	120	94	26	+ 12
Bureau of Standards.....	230	108	338	296	42	+ 26
Bureau of Fisheries.....	392	5	397	80	317	- 1
Bureau of Lighthouses.....	57	5,563	5,620	42	5,578	- 4
Coast and Geodetic Survey.....	246	482	728	264	464	+ 381
Bureau of Navigation.....	40	61	101	28	73	+ 6
Steamboat-Inspection Service.....	196	69	265	9	256	+ 3
Total.....	2,054	7,151	9,205*	1,712	7,493	+ 417

* Includes 372 enlisted men on vessels who in previous reports have been included under miscellaneous employments. The actual increase in the force was 9 persons, employed under lump appropriations.

The following table gives a summary of changes in the personnel of the Department during the fiscal year ended June 30, 1914:

Bureau.	Appointments, etc.			Separations.			Miscellaneous changes.		
	Perma- nent.	Tem- po- rary.	Total.	From perma- nent posi- tions.	From tem- po- rary posi- tions.	Total.	Prom- otions.	Re- duc- tions.	Mis- cella- neous.
Office of the Secretary.....	30	2	32	25	3	28	14	1	3
Bureau of the Census.....	616	12	628	608	1	609	88	16	49
Bureau of Corporations.....	22	2	24	14	1	15	54	.....	.....
Bureau of Foreign and Do- mestic Commerce.....	44	33	77	25	17	42	35	4	27
Bureau of Standards.....	113	38	151	49	42	91	131	1	72
Bureau of Fisheries.....	69	28	97	55	16	71	45	12	40
Bureau of Lighthouses.....	324	110	434	305	104	409	301	95	197
Coast and Geodetic Survey..	57	57	114	38	44	82	118	6	40
Bureau of Navigation.....	22	11	33	13	12	25	12	.....	11
Steamboat-Inspection Ser- vice.....	15	4	19	15	2	17	10	1	5
Total.....	1,312	297	1,609	1,147	242	1,389	808	136	444

Vacancies in presidential positions have been filled during the fiscal year ended June 30, 1914, as follows:

Position.	Compensa- tion.	Authority.
Director of the Census ^a	\$6,000	32 Stat., 51.
Superintendent of naval construction, Bureau of Lighthouses ^b	3,000	36 Stat., 827.
Supervising inspector, fifth district, Steamboat-Inspection Service, with headquarters at Boston, Mass.....	3,000	R. S., 4404.
Supervising inspector, sixth district, Steamboat-Inspection Service, with headquarters at Louisville, Ky. ^c	3,000	Do.

^a Appointment confirmed by the Senate, June 26, 1913, and appointee commissioned on same date. Assumed office July 1, 1913.

^b Position filled by transfer of a classified competitive employee in the Lighthouse Service. Confirmation by Senate not required.

^c Position filled by promotion of a classified competitive employee in the same service.

Since the end of the fiscal year three presidential appointments have been made, namely, Chief of the Bureau of Foreign and Domestic Commerce, (First) Assistant Chief of the Bureau of Foreign and Domestic Commerce, and (Second) Assistant Chief of the Bureau of Foreign and Domestic Commerce. Two of the appointees originally entered the service through competitive civil-service examination.

In considering recommendations for promotions the Department in the past has utilized its efficiency records, which were obtained as a result of the investigations made in 1906, 1909, and 1911. No investigation has been made since 1911, because

Congress has imposed upon the Civil Service Commission the duty of establishing an efficiency system for the various executive departments; and as the commission has not yet established such a system, the Department has no current efficiency records which might be used for the purpose stated. It can and does, of course, consider the ratings taken in 1911, but only to a limited extent, owing to the numerous changes which have since occurred. It is the practice to give very close attention to the merits of individual cases as submitted by bureau chiefs, who, in addition to any special reasons which exceptional cases may involve, support their recommendations by a certificate to the effect that the records of the various employees have been carefully considered, and that the persons recommended are most entitled to advancement by reason of their superior efficiency and the character of work on which they are engaged. The policy of this Department to select officers and employees from the lower grades to fill vacancies in higher positions, whenever practicable, is proving an incentive to increased efficiency.

By reason of the removal of the Bureau of the Census to the Commerce Building the labor, watch, char, and engineer forces of this Bureau and the Office of the Secretary were consolidated, and it became necessary, therefore, to dispense with 28 subclerical positions in the Census Bureau at the close of the fiscal year. The Department, as early as April 9, 1914, took up the question of providing for 25 employees (still remaining) whose services would not be required after June 30, 1914. At the close of the fiscal year 24 of these employees had been provided for.

The Department of the Interior during the early part of the present calendar year invited attention to the contemplated reduction in the clerical and examining forces of the Bureau of Pensions, and requested that consideration be given to the matter of transferring some of the employees whose services in that bureau would probably be discontinued by operation of law on July 1, 1914; also to other employees who could be transferred advantageously from that bureau to suitable positions in this Department. At the close of the year five of the employees of the Bureau of Pensions had been provided for in this Department.

In the reorganization of the force of the Bureau of Foreign and Domestic Commerce, to meet the terms of the legislative, executive, and judicial appropriation act for the fiscal year 1915, the number of subclerical employees was reduced from 12 to 1, thus abolishing

6 subclerical positions. While the bill was pending in Congress steps were taken along the same lines as in the case of the Census employees, with the view of making provision for the 6 employees affected.

In spite of the occasional loss of aged employees, due usually to death or resignation, superannuation still increases, thus accentuating the disadvantages of an impaired service, the discouragement of a retarded rate of promotion for young and deserving employees, and the feeling of unrest and perhaps dread of dismissal by those who are aware of the fact that the best service they are able to render does not reach the average standard of the younger employees of the same class and grade. While superannuation probably exists, it has been found difficult under present conditions to obtain admissions of the actual conditions from the higher officials under whom aged employees serve. Naturally, so far as may conscientiously be done, officials are reluctant to make any statement which might lead to the separation from the service of those who have given the best years of their lives to the Government and who, if deprived of their income, would face poverty and want.

In both governmental and commercial centers retirement on some system of pensions for superannuated employees is becoming more generally recognized as both a practical and profitable movement. That such a policy can be carried out by the Government so as to be ultimately a means of economy seems to have been demonstrated. A system of retirement has been adopted by the leading Governments of Europe, and its growth among business corporations indicates the value of the results accruing from the policy. It is found to effect not only immediate relief, but its benefits are seen in its influence on the younger and more active class of employees. It removes much of the incentive to seek other employment where the prospects are brighter; it induces many to render more nearly the maximum of service; and improves the esprit de corps when it is known that the faithful employees may expect to be cared for after they have become incapacitated in the service.

The act of January 16, 1883, to regulate and improve the civil service of the United States provided, among other things, for the classification of all the offices, places, and employments to which it was applicable, for open competitive examinations, selection and appointment according to grade from the persons

graded highest, and the apportionment of appointments in the departments at Washington among the several States and Territories and the District of Columbia, upon the basis of population as ascertained at the last preceding census. The intent of the framers of the act to insure an efficient administration of the affairs of the Government would seem to be shown in the declaration that appointments shall be apportioned as nearly as the conditions of good administration will warrant. In order to insure efficient administration, it is essential that nominating officers have before them at the time of making selection for appointment the names of well-qualified eligibles. The efficiency of the personnel is an important factor in an economical administration of public affairs, and it is not believed that the theory of a geographical division of appointments should be carried out to such a degree as to preserve an ideal the efficacy of which has long been questioned.

It is perhaps unfortunate from an administrative point of view that the interpretation placed at one time upon the law of apportionment has been such that in some cases it has been necessary to select for appointment eligibles with comparatively low ratings when there were on the register the names of persons with higher ratings who, under the apportionment law and rule, were not considered as available for certification. The exhaustive investigation in 1913 of the Civil Service Commission's methods of preserving an apportionment of appointments, made by the President's Commission on Economy and Efficiency, showed that a rigid division of appointments among the several States and Territories, according to population, was not in the interests of the service, and this commission recommended a plan of apportionment whereby the ratings of the eligibles as well as the condition of the apportionment would determine the question of priority of certification for appointment. A modification of the principle previously in force had already been adopted by the Civil Service Commission for certain positions of a scientific and technical nature and this was afterwards extended, probably as the result of the report of the President's commission, to other positions, although not to the extent recommended. The change seems to have worked an improvement in the personnel of the service.

On December 5, 1913, the Department issued a circular relating to the forms of political activity forbidden by the civil-service law and rules, and the illegal collection or payment of political assess-

ments. The circular was based upon the prohibition contained in civil-service Rule I, section 1, which reads as follows:

No person in the executive civil service shall use his official authority or influence for the purpose of interfering with an election or affecting the results thereof. Persons who by the provisions of these rules are in the competitive classified service, while retaining the right to vote as they please and to express privately their opinions on all political subjects, shall take no active part in political management or in political campaigns.

The application of this rule, particularly its application to the forms of political activity which are forbidden, were carefully explained, and reference was made to the sections of the Criminal Code prohibiting a Federal officer or employee from being concerned in soliciting or receiving a political assessment, subscription, or contribution from any other Federal officer or employee. It has been the wish of the Department to apply the rule and statutes referred to, and a copy of the circular is furnished to each employee at the time of his appointment. Three complaints of alleged political activity were filed against employees of the Department during the year. Upon investigation the complaints were not sustained.

Printing and Binding.

The publications of the Department have a wide range and include subjects within the fields of science, industry, shipping, trade, business management, finance, and statistics, but all clearly classifiable under the general head of commerce.

In the bill to revise the laws relating to public printing and binding, now before Congress, it is proposed to establish in each executive department and independent Government establishment a division of publications, with duties identical with those which at the organization of this Department were assigned to and have ever since been performed by its Division of Publications. This proposed action by Congress may reasonably be construed as expert testimony to the wisdom displayed by the Department of Commerce in its formative period in establishing such an office under the immediate head of the Department, and giving this office control over its publication work and over all expenditures for the same, thus insuring uniformity in the typographical form and style of its publications and economy in the expenditure of the Department's annual allotment for printing and binding. Briefly, the Division of Publications is charged with the conduct of the business which the Department transacts with the Gov-

ernment Printing Office, and with general supervision over all printing for the Department, including editing and preparing copy, illustrating and binding, and keeping records of expenditures. It has in charge the distribution of publications, the maintenance of mailing lists, the advertising done by the Department, and the correspondence which these duties entail.

The allotment to the Department for printing and binding during the fiscal year 1914 was \$525,000. Of this sum \$84,000 was on June 30, 1913, transferred to the Department of Labor, in accordance with the requirements of the act approved May 1, 1913. There remained, therefore, a balance of \$441,000 available for the Department of Commerce, of which \$410,700.77 was expended, leaving an unused balance on June 30 of \$30,299.23.

The increase in expenditures in 1914 over those in 1913 was \$80,725.85, or 24.46 per cent. Expenditures in 1914, however, include \$110,758.32 expended for the Bureau of the Census, while there was expended for that Bureau during the preceding year only \$38,270.24, other expenditures in 1913 being from appropriations for the Thirteenth Decennial Census. Excluding figures for the Bureau of the Census in both years, the increase in expenditures was but \$8,237.77, or 2.82 per cent.

The estimated cost of unbilled and uncompleted work of the Department at the Government Printing Office on July 1, 1914, was \$42,953.41, while the actual cost of such work at that office on the same date in 1913 was \$36,686.50.

During the year the Department issued on the Public Printer 3,084 requisitions for printing and binding, as compared with 2,735 in 1913, an increase of 349. Of the requisitions issued in 1914 there remained at the close of business on June 30, 1914, 355 upon which deliveries of completed work had not been made, compared with 344 on the same date in 1913.

The following table shows the cost of printing and binding for each of the bureaus, offices, and services of the Department during the fiscal years 1913 and 1914, together with the increase or decrease for each bureau, office, and service and the estimated cost of the work on hand but not completed June 30, 1914:

Bureau, office, or service.	Cost of work delivered.		Increase (+) or decrease (-).		Estimated cost of work not completed June 30, 1914.
	1913	1914	Cost.	Per cent.	
Office of the Secretary.....	\$19,408.28	\$12,655.94	—\$6,752.34	— 34.79	\$828.45
Appointment Division.....	396.05	383.58	— 12.47	— 3.15	58.54
Disbursing Office.....	1,133.42	698.09	— 435.33	— 38.44	.....
Division of Supplies.....	363.75	505.43	+ 141.68	+ 38.95	6.30
Bureau of the Census.....	^a 38,270.24	110,758.32	+72,488.08	+189.41	12,730.72
Coast and Geodetic Survey.....	26,526.52	28,837.49	+ 2,310.97	+ 8.71	3,783.51
Bureau of Corporations.....	11,524.50	10,468.46	— 1,056.04	— 9.16	3,155.75
Bureau of Fisheries.....	12,897.91	12,687.49	— 210.42	— 1.63	2,346.99
Bureau of Foreign and Domestic Commerce.....	142,818.07	132,039.95	—10,778.12	— 7.55	5,948.76
Bureau of Lighthouses.....	20,219.62	25,560.31	+ 5,340.69	+ 26.41	2,990.51
Lighthouse Service.....	6,716.44	7,298.93	+ 582.49	+ 8.67	733.23
Bureau of Navigation.....	^a 12,130.37	12,473.34	+ 342.97	+ 2.83	113.97
Shipping Service.....	2,032.81	2,646.77	+ 613.96	+ 30.20	393.34
Radio Service.....	1,102.21	893.83	— 208.38	— 18.91	76.07
Bureau of Standards.....	18,278.49	28,033.31	+ 9,754.82	+ 53.37	3,973.54
Office Supervising Inspector General,					
Steamboat-Inspection Service.....	2,456.71	2,637.22	+ 180.51	+ 7.35	10.58
Steamboat-Inspection Service.....	6,767.34	8,768.90	+ 2,001.56	+ 29.58	3,582.05
Customs Service.....	6,932.19	13,353.41	+ 6,421.22	+ 92.63	2,221.08
Total.....	^a 329,974.92	410,700.77	+80,725.85	+ 24.46	42,953.41

^a In 1913 the allotment to the Department for printing and binding was reimbursed from other appropriations for the following expenditures: For the Radio Service, \$1,716.58; for the Bureau of the Census for printing in connection with publishing statistics relating to cotton and tobacco), \$5,011.48; total, \$6,728.06.

It is worthy of note that though the work of the Department has expanded in recent years its expenditures for printing and binding have remained practically stationary. This is evidenced by the following statement, which shows for each of the fiscal years 1907 to 1914 the amount available to the Department for printing and binding, the amount expended, the unused balance on June 30, and the cost of work not completed at the close of the year. Figures prior to 1913 include expenditures for bureaus and services transferred to the Department of Labor by the act of March 4, 1913, but do not include those for the Bureau of the Census, which was provided for by separate allotments or appropriations.

Fiscal year.	Allotment.	Expenditures.	Unexp. balance.	Cost of work not completed June 30.
1907.....	\$375,000.00	\$332,125.05	\$42,874.95	\$34,740.24
1908.....	375,000.00	342,962.36	32,037.64	47,053.39
1909.....	375,000.00	374,939.92	60.09	29,139.26
1910.....	^a 376,337.43	^a 362,530.43	14,807.00	42,515.93
1911.....	^b 381,500.00	^b 375,575.08	5,924.92	46,173.12
1912.....	375,000.00	374,995.64	4.36	43,956.76
1913.....	^c 329,974.06	^c 329,974.92	3.14	36,686.30
1914.....	441,000.00	420,700.77	30,299.23	^d 42,953.43

^a Includes \$1,337.43 expended for supplies furnished the Bureau of the Census, for which the Department's allotment was reimbursed.

^b Includes a special appropriation of \$6,500 for the printing of the World Trade Directory. The entire sum was expended for the publication.

^c Includes \$6,706.06 for printing done for the Bureau of the Census (publishing statistics relating to cotton and tobacco) and the Bureau of Navigation (Radio Service), for which the Department's allotment was reimbursed.

^d Estimated.

The following statement shows the amount and cost of each class of work called for by requisitions on the Public Printer during the fiscal year 1914, and affords a comparison with the amount and cost of these classes during the preceding fiscal year:

Class.	1913	1914	Increase (+) or decrease (-).	
	Number.	Number.	Number.	Per cent.
Blank forms.....	8,409,705	14,301,618	+ 5,891,913	+ 70.06
Reports, pamphlets, etc.....	7,287,545	7,634,930	+ 347,385	+ 4.77
Letterheads.....	1,171,500	1,789,000	+ 617,500	+ 52.71
Envelopes.....	35,045	347,250	+ 312,205	+ 890.87
Circulars, notices, and summaries.....	155,150	789,875	+ 574,725	+ 370.43
Index cards.....	553,700	1,620,900	+ 1,066,500	+ 192.61
Guide cards and folders.....	145,650	152,700	+ 7,050	+ 4.84
Memorandum sheets.....	4,686,000	1,525,000	- 3,161,000	- 67.46
Blank books.....	27,735	13,355	- 14,380	- 51.85
Miscellaneous books (binding).....	2,575	4,530	+ 1,955	+ 75.92
	Cost.	Cost.	Cost.	Per cent.
Blank forms.....	\$32,954.51	\$45,226.19	+\$12,271.68	+ 37.24
Reports, pamphlets, etc.....	274,502.23	338,247.73	+ 63,685.50	+ 23.20
Letterheads.....	1,512.23	2,960.95	+ 1,450.72	+ 95.93
Envelopes.....	139.32	311.61	+ 152.29	+ 95.59
Circulars, notices, and summaries.....	754.71	3,594.09	+ 2,839.38	+ 376.22
Index cards.....	665.50	1,339.47	+ 653.97	+ 95.40
Guide cards and folders.....	762.25	740.27	- 22.98	- 3.45
Memorandum sheets.....	2,334.28	1,214.53	- 1,119.75	- 47.97
Blank books.....	10,549.95	20,391.99	+ 9,842.04	+ 92.40
Miscellaneous books (binding).....	4,169.86	8,890.27	+ 4,720.41	+ 112.96
Miscellaneous.....	1,509.42	581.65	- 927.77	- 61.47
Total.....	329,974.92	410,700.77	+ 80,725.85	+ 24.46

During the fiscal year 1914 the Department issued 1,054 publications, compared with 843 for the same bureaus and offices in the fiscal year 1913, of which 53, against 23 in 1913, were printed in two or more editions during the year, while 110, compared with 73 last year, were reprints, without change, of issues of earlier years. The publications issued in 1914 contained a total of 54,768 printed pages, compared with 41,507 in 1913, and there were printed of them for the Department a grand total of 8,586,605 copies, against 7,286,930 in the preceding year, an increase of 1,299,675 copies.

The publication work of each bureau of the Department for the past two fiscal years is summarized in the following table:

Bureau.	Publications.		Pages.		Copies printed for Department.		Cost.	
	1913	1914	1913	1914	1913	1914	1913	1914
Office of the Secretary.....	30	36	2,350	2,090	20,330	227,000	\$6,000.47	\$4,099.70
Bureau of the Census.....	30	258	2,247	22,975	221,700	2,056,700	\$4,794.20	\$4,250.46
Coast and Geodetic Survey.....	25	25	2,070	4,624	21,300	56,225	\$4,321.00	\$2,720.00
Bureau of Corporations.....	20	25	2,254	2,225	20,225	26,700	\$4,500.25	\$4,672.46
Bureau of Fisheries.....	40	22	2,225	2,225	44,225	21,200	\$2,454.20	\$1,084.77
Bureau of Foreign and Domestic Commerce.....	408	405	26,248	26,200	6,262,405	6,200,400	\$26,970.75	\$26,200.40
Bureau of Lighthouses.....	205	205	2,247	2,420	26,405	272,000	\$2,792.20	\$2,720.19
Bureau of Navigation.....	26	20	2,000	2,000	20,000	20,200	\$2,000.00	\$2,000.00
Bureau of Standards.....	205	205	2,070	2,070	20,700	20,700	\$2,070.00	\$2,070.00
Steamboat Inspection Service.....	20	20	2,200	220	200,000	271,200	\$4,200.00	\$2,200.00
Total.....	102	1,054	41,507	54,768	7,286,930	8,586,605	\$41,507.42	\$41,507.42

* Figures relate to publications actually becoming available during the year for distribution. Frequently they do not agree with similar figures as a printing table giving the cost of work done by the Government Printing Office during the year. Frequently the cost of a publication is charged against allotments for two or more fiscal years.

During the year 1913-14, publications and printed material of the Department were distributed to the public in accordance with a total of 72,170. This increase was due to the increase in the number of mailing lists which resulted in the removal of a large number of names, and to an extension of the Department's policy in regard to the promiscuous free distribution of its publications. The total number of publications and printed material distributed during the year was 72,170. The total number of publications and printed material distributed during the year was 72,170. The total number of publications and printed material distributed during the year was 72,170.

prised a mailing list distribution of 6,507,834 and a distribution in response to individual requests of 295,289.

During the year the Department received and acted on 85,170 miscellaneous requests, calling for 484,331 copies of publications. This was an average of 278 requests and nearly 1,600 publications for each working day.

The number of publications of the Department in stock and available for distribution to the public on July 1, 1913, was 340,005, to which were added during the year 7,037,764, making a total of 7,377,769. Of this total, 7,035,029 were distributed during the year, leaving 342,740 on hand at the close of business June 30, 1914.

In consonance with the policy of the Department to place its publications on a sales basis, so far as practicable, and to limit free distribution to well-defined public or quasi-public classes, the free distribution of practically all publications of the Bureau of Foreign and Domestic Commerce is now confined to libraries, educational institutions, the press, and commercial or other organizations. Editions of the Bureau's publications have been reduced, and individuals requesting copies are referred to the Superintendent of Documents, who maintains an ample stock for sale at nominal prices based on the cost of printing from stereotype plates. Publications of the Bureau which are sold either on a subscription basis or at a flat rate include the Daily Consular and Trade Reports, Monthly Summary of the Foreign Commerce of the United States, Quarterly Statement of Imported Merchandise Entered for Consumption, Statistical Abstract of the United States, annual report on the Foreign Commerce and Navigation of the United States, Commercial Relations of the United States with Foreign Countries, reports of special agents sent abroad to investigate trade conditions with respect to selected industries, and special reports of consular officers on assigned subjects.

The Bulletin of the Bureau of Standards (issued four times a year) is also now sold by the Superintendent of Documents at 25 cents per number, or \$1 for the four numbers constituting a volume, all back numbers of the Bulletin being available. The Department edition has been reduced from 2,500 to 1,500 copies.

It is believed that the present free distribution of large and expensive editions of the light lists and buoy books of the Bureau of Lighthouses could also be curtailed without detriment to the interests served. Other governments put a price on similar publications issued by them. There is, however, some question as to a practical plan for the distribution. Tide Tables, Coast Pilots,

and Charts, which have for many years been issued and sold by the Coast and Geodetic Survey, may be conveniently purchased by mariners at agencies established at all important ports on the seacoast and the Great Lakes. The publications of the Bureau of Lighthouses should, of course, be procurable with equal facility, but it is doubtful if the Superintendent of Documents at present has authority for establishing the necessary number of agencies and supplying them with stock. Some specific legislation may therefore be necessary before the sales plan may be adopted for these publications.

The results have been so gratifying that further gradual extensions of the sales plan are in contemplation, as it is believed to furnish the most equitable and economical distribution of the Department's many publications. Experience has demonstrated that persons are willing to pay the merely nominal prices placed on the publications by the Superintendent of Documents, and when distributed under this plan the Department has a reliable method for judging the public demand for its publications and knows that they are reaching persons who have a real interest in them.

Sales by the Superintendent of Documents during each of the past five years of publications issued by the Department are summarized in the following statement, giving the total number of copies of publications sold and the total receipts from such sales. The number of copies shown in the table does not in any case include distribution of publications to regular subscribers.

Fiscal year.	Copies.	Receipts.
1910.....	7,114	\$1,486.05
1911.....	9,395	\$14,988.95
1912.....	^b 30,775	^c 8,712.94
1913.....	11,248	^d 6,271.75
1914.....	^e 43,226	^f 13,793.35

^a Includes \$27.10 received for subscriptions and \$13,255 from sales of the 1911 World Trade Directory.

^b Includes 17,150 copies of 2 publications sold at a nominal price for redistribution.

^c Includes \$2,749.75 received for subscriptions and \$2,450 from sales of the 1911 World Trade Directory.

^d Includes \$1,958.55 received for subscriptions and \$1,090 from sales of the 1911 World Trade Directory.

^e About 13,000 of this number represents a distribution, at a nominal sales price, of economic circulars of the Bureau of Fisheries.

^f Includes \$4,029.25 received for subscriptions.

Work of the Solicitor's Office.

During the fiscal year ended June 30, 1914, 138 contracts totaling \$828,890, together with 8 contracts of indeterminate amount, 28 leases amounting to \$274,614, 13 revocable licenses

amounting to \$978, insurance policies in the sum of \$164,400, deeds involving payments of \$3,986, and 169 bonds amounting to \$436,539 were examined (approved, disapproved, drafted, redrafted, modified).

The number of legal opinions rendered, formal and informal (memorandum), totaled 287.

In addition to this, 490 miscellaneous matters, embracing everything submitted for the advice or suggestion of the Solicitor, or for the formulation of departmental action, not included in the foregoing items, were handled by this office.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

This important Bureau, which is the spearhead of the Department's active commercial work, is for the first time in the possession of an organization adequate for its purposes. It works abroad through a threefold force, viz, the commercial attachés, the Consular Service, and the commercial agents.

Commercial Attachés.

The requirement for commercial attachés was fully explained in my report for the fiscal year ended June 30, 1913 (pp. 60-62). Congress having provided an appropriation of \$100,000 to establish this force, the subject was taken up soon after the close of the fiscal year with the Civil Service Commission, which cooperated in preparing blanks for the examination required by law and kindly arranged to have the written examination take place at its offices in 12 cities. A committee of officers from both the State Department and the Department of Commerce was formed to conduct an oral examination in the case of such applicants as passed the written one, and carefully revised ratings were made based upon the actual results of these examinations. It was arranged and announced that the experience of officers in the service of the Department of State and the Department of Commerce in actual commercial promotive work should be accepted in lieu of a portion of the examination, and it was provided by Executive order that consuls who might be promoted to the attaché service should not thereby lose their standing in the Consular Service. As a result of the examinations the following appointments have been made since the close of the fiscal year at the salaries stated:

- A. H. Baldwin, commercial attaché at London, England, \$5,000.
- Erwin W. Thompson, commercial attaché at Berlin, Germany, \$5,000.
- C. W. A. Veditz, commercial attaché at Paris, France, \$5,000.
- Henry D. Baker, commercial attaché at Petrograd, Russia, \$5,000.
- Albert Hale, commercial attaché at Buenos Aires, Argentina, \$4,500.
- Julian H. Arnold, commercial attaché at Peking, China, \$4,500.
- Lincoln Hutchinson, commercial attaché at Rio de Janeiro, Brazil, \$4,500.
- A. I. Harrington, commercial attaché at Lima, Peru, \$4,000.
- V. L. Havens, commercial attaché at Santiago, Chile, \$4,000.

All of the above appointees successfully passed both the written and oral examinations, save those who were promoted from the Government service after a careful review of their experience in

the kind of work the attaché will be required to do. Appointments of this kind were made in the case of Mr. Baldwin at London, Mr. Arnold at Peking, and Mr. Baker at Petrograd.

It is expected that all of these attachés will be at their posts by the time this report is printed. It is probable that the attachés at Berlin and Paris will be temporarily engaged in important work, collateral to their regular duties, in countries adjoining those to which they are assigned pending a further determination of the existing conditions in central Europe.

The cooperation of the Consular Service in our commercial work is a striking example of how broad-spirited cooperation between two departments can foster the public good. Too much can not be said in praise of the considerate and helpful spirit shown by the Secretary of State and all his subordinates in helping forward through an assistance both generous and skillful the important work this Bureau is called upon to do. The work of the Consular Service was never so well done as to-day, and it constantly improves. It is the effort of this Department to supplement the intelligent activity of our consuls with an equally intelligent use of the mass of valuable material which their labors place at our disposal.

The commercial agent is the traveling man of the Department. He takes a single subject or a group of subjects and goes from country to country in his study of them, submitting reports upon the one general theme from the point of view of many nations and of diverse markets.

The force thus briefly described may also be characterized—

The permanent officer with the general outlook—the attaché.

The permanent officer with the local outlook—the consul.

The traveling officer with a single subject—the commercial agent.

It is not meant in any way to exclude from kindly thought the important work of the consuls general. Rather, it is the spirit of this Department to cooperate with them in hearty appreciation of the important services they render. Our force in the foreign field is instructed that they are not rivals of our other national officers there, but helpers to them; that they are all engaged in the one common work of pushing American commerce, and that only the spirit of broad helpfulness by each to the other and by all for the common good will be tolerated.

Commercial Agents.

In the month of October, 1914, there were in service, or about to start to their respective fields, the following commercial agents:

H. N. Douthitt, electrical and general machinery supplies, South America.
Charles Ferguson, commercial investigations in the United States.
William A. Reid, special services in developing export trade, United States.
F. H. Smith, markets for lumber in the Orient.
S. S. Brill, markets for hardware in South America.
L. L. Bucklew, furniture trade in South America.
Garrard Harris, general commercial studies in Latin-American countries.
Benjamin Joachim, clothing trade in Latin-American countries.
Roger E. Simmons, lumber industry in South America.
Ralph M. Odell, cotton textiles investigation in the Orient.
J. A. Massel, general machinery, including machine tools, in South America.
L. B. Hoyt, general trade conditions in Mexico.

There is pending the appointment of another commercial agent to inquire into markets abroad for American fruits and still another to inquire into markets for general merchandise in Central America, Venezuela, and Colombia.

During the fiscal year commercial agents were engaged on investigations as follows:

E. N. Hurley, banking and credits in South America.
J. Alexis Shriver, canned goods in foreign countries.
Frank G. Bolles, coke-oven by-products and electric furnaces.
A. J. Wolfe, commercial laws in foreign countries.
W. A. Graham Clark, cotton textiles in Japan and Manchuria.
Ralph M. Odell, cotton textile trade and industry in China, India, and Australasia.
Henry D. Baker, commercial conditions in India.
E. W. Thompson, oil-seed products investigation.
E. A. Thayer, proprietary medicines, drugs, and canned goods.
D. C. Alexander, machinery trade in the Far East.
F. J. Sheridan, Grosvenor M. Jones, C. D. Snow, and C. W. A. Veditz, pottery investigation (cost of production).

Since the close of the fiscal year Dr. Edward Ewing Pratt has been appointed Chief of the Bureau and Mr. E. A. Brand and Dr. Frank R. Rutter have been appointed Assistant Chiefs.

Branch Offices.

The provision by Congress of a special fund for promoting commerce in Latin America, in addition to the general fund for promoting commerce, has not only permitted the selection of an active staff of trained students of commerce and industry but has also permitted another marked forward step in the organization of the Bureau for efficient work. It is all very well to have a good force in the foreign field, but if proper means do not exist to put the work of this force into touch with American commerce and industry the effort is largely wasted. Washington is not a commercial and industrial city, and it is difficult by mail or by publication to reach as intimately and effectively as is necessary †

industrial and commercial pulse of the country. Therefore, during the fiscal year, in an experimental way, an office was opened in New York to see whether a closer touch could thus be had with the business world and whether the new service would be used and appreciated. The success of that office led to the opening of others in Chicago, San Francisco, and New Orleans, and shortly after these there followed additional offices in Boston, Atlanta, and Seattle. An eighth office has only recently been established in the city of St. Louis, and other large cities are applicants.

This movement has been embarrassingly successful, for the appreciation of the mercantile world of this outward movement into their midst has been such as not only to lead to the calling for other offices beyond our power to supply them but to impose upon those offices which exist a burden of helpful work which they desire indeed to do but for which their means are quite inadequate.

To these offices are sent the consuls who come from abroad. The commercial attachés go thither before leaving for their posts or upon their return. The commercial agents make them their headquarters for bringing their work into touch with the local business community. Instead, therefore, of one center in Washington, from which substantially all contact with the business world was had by mail, there are now nine offices, including the central one, in eight of which contact with the business community is had personally and hourly.

By this means the Consular Service is made a live factor to business men, and both the consul and the merchant are the gainers thereby. The commercial agent on returning from abroad with a mass of accumulated information does not deposit it in a bureau to be hidden with other accumulations of like knowledge, but takes it out to the men who need it in the centers in which they conduct their affairs.

One further step is taken as this report goes to press. A traveling representative of the Bureau is put in the domestic field who will go from city to city conferring with merchants and manufacturers, informing them of the work of the Bureau, learning from them how its services to American commerce can be improved, instructing them how to avail themselves of it, and thus representing directly and personally the Bureau in its effort to extend our commercial prosperity.

To the above must be added the numerous publications and special communications which the Bureau sends out, a work which

is of a very diverse and extensive character and which is rapidly extending.

The services thus rendered to commerce are of a directly practical nature. Were this doubted, it would be easy to show to the skeptical records of actual orders obtained through the Bureau's action in making foreign conditions known to the domestic producer.

Under the new organization, completed but not yet fully in service, the Bureau anticipates a large development of its work for fostering our trade.

In Washington the facilities for digesting and distributing commercial information of every class are fully organized, practical methods are used, and excellent index systems, classified lists of business firms, numerous forms of publicity, a trained corps of editors, translators, statistical clerks, and tariff experts, are combined to render effective the useful trade facts collected for the commercial public.

For the details of the work of this office, reference is made to the annual report of the Chief of the Bureau. Practically all its branches show a development during the year. Its publications have been more numerous and have been widely circulated. These bulletins are now sold, free distribution being limited to those agencies (such as chambers of commerce and other commercial organizations, libraries, and trade papers) which materially further the publicity desired for trade information.

The statistical service has been much modified, with the purpose of emphasizing the promotive value of the important records of import and export commerce. The record of existing foreign tariffs has been currently maintained. The commercial agents of the Bureau have not only made many very practical reports of markets for cotton textiles, canned goods, drugs and proprietary medicines, by-products of coke ovens, banking and credits in South America, etc., but they have visited trade centers, throughout the United States and by personal interviews and public addresses have much enhanced the effect of their work. It is regretted that a recent law hampers this most useful service by forbidding the attendance of Federal employees at trade conventions except at their own expense. It surely was not the intention that the law should prohibit the commercial representatives of the country from making known directly to business organizations the information which they have traveled far and labored hard to get, yet this is the effect of the restriction embodied in the law.

Cost of Production.

The important work which Congress assigned to the Bureau in collecting costs of production of articles subject to import duty has been actively carried on in two branches of industry. A survey of the earthenware pottery industry in the United States and Europe has just been completed, and most practical and valuable results have been obtained. Over 90 per cent of the American potteries were investigated, and no more complete study of an industry, it is believed, was ever made. A similar study of the great clothing industry is now in progress. The committees of Congress will find in such reports the essential facts in regard to an industry necessary to intelligent legislation on tariff matters. Such facts have heretofore usually been available not from a disinterested governmental source but from those whose interest might lie either in increasing or lowering tariff rates. The value of such detached and disinterested investigations of our industries is no longer in question, and this service is not alone useful in relation to tariff legislation but is undoubtedly of very marked promotive value to any industry that may be studied by competent agents.

Statistics.

Much constructive work still remains to be done, based on the broad foundation of plan and policy which has been established in the various branches of this service. The statistics of our commerce, for example, are now collected systematically by this Department only in regard to the trade that passes through our coast and border ports. This constitutes only 5 to 6 per cent of our commerce. The vast movements of trade within our boundaries are not recorded by this office. This is a serious defect in our system of collecting useful trade facts, and should be corrected. Provision should be made as soon as practicable for a suitable appropriation to establish the facilities for collecting and publishing these statistics of internal commerce. The branch offices of the Bureau furnish admirable organization units for beginning this work, and its value would be made clear at once to Congress and the public.

A general study of the methods of collecting, compiling, and publishing trade statistics is now in progress and will have an important bearing on the development of this branch of the promotive work of the Bureau. The Bureau has long been satisfied that the statistics of our import and export commerce, particularly of the latter, are inaccurate. They are collected under a

law passed in 1820, when much, if not most, of that which constitutes modern commerce had no existence and when our relation to the world was radically unlike its present one. It is believed that the statistics of our export trade are incorrect to an extent sufficient to alter at times a trade balance on mercantile transactions which is actually in our favor into one which appears to be the reverse.

The subject having been brought to the attention of the Secretary of the Treasury, he has kindly consented that an officer of this Bureau may be placed in the New York customhouse with a view to examining, and by cooperation correcting, the methods of collecting export statistics, so that the existing inaccuracies may be removed so far as it is possible to do so without legislation. With this in view, Dr. Frank R. Rutter, Assistant Chief of the Bureau, will be sent to the New York customhouse on this important service.

It is important that export associations and trade councils dealing with foreign business should exert their utmost influence to have our export statistics accurate. In a business as large as our export trade now is, an average error of 10 per cent in the valuation of our exports might well mean a difference of two hundred millions in the apparent value of the country's sales abroad, and such a sum might well turn and in certain years would have turned a balance seemingly against us on such transactions into one which really was in our favor. This would have a direct effect upon mercantile, industrial, and financial thought and action, now, it is to be feared, somewhat inaccurately informed upon this important subject.

For the coming year it is essential that the present useful activities of this office be vigorously maintained, and that such additional funds be provided as may be needed to care for the increase in the demands upon the Bureau, an increase which has been very marked during the past year and will no doubt continue.

The special fund for promoting commerce in Central and South America, of which 80 per cent is allotted to field investigations and the remainder used in Washington, should be continued and supplemented, as a permanent occupation of Latin-American markets is the only wise policy for our Government to support. The appropriation for commercial attachés should in time be increased to permit the dispatch of our trade representatives to the posts not now established which were recommended last year.

The branches of the Bureau in the United States have so completely justified their existence by useful and practical service to business firms that other cities should receive the aid now given in New York, Chicago, San Francisco, Seattle, New Orleans, Atlanta, Boston, and St. Louis.

The studies of costs of production in pottery manufacture and the clothing industry have also proven their worth, and should be carried into other industries. Fortunately, the work of this Bureau so clearly pays for itself in increased commerce and in aid to business that I feel that liberal support for its activities constitutes real economy in the expenditure of the Nation's funds.

BUREAU OF CORPORATIONS.

MERGER OF BUREAU IN FEDERAL TRADE COMMISSION.

According to an act of Congress of September 26, 1914, providing for a Federal Trade Commission, the Bureau of Corporations will be merged in the said commission immediately upon its organization. This act provides that the Bureau of Corporations shall then cease to exist, and that its employees shall become employees of the commission, and that the commission shall take over all the records, furniture, and equipment of the Bureau, and the conduct of all work and proceedings in which it shall then be engaged, while all appropriations made for the support and maintenance of the Bureau and its work are continued and authorized to be expended by the commission.

In consequence of the merger of the Bureau of Corporations in the Federal Trade Commission thus provided by law, and the fact that the direction of the present work of the Bureau will be intrusted to the commission, which is made independent of this Department, the usual statement with respect to policies and plans for the future have necessarily no place in this report.

The present report covers primarily the work of the Bureau of Corporations for the fiscal year ended June 30, 1914, but in view of the impending merger of the Bureau in the Federal Trade Commission, and of the fact that at the close of the next fiscal year the Bureau will no longer be within the jurisdiction of this Department, a statement is made also concerning the work of the Bureau subsequent to the said fiscal year, which brings the account of its activities practically down to the time of its severance from this Department, thus avoiding the necessity of referring to it in detail in subsequent annual reports of the Secretary of Commerce.

WORK OF THE YEAR.

The work of the Bureau of Corporations for the fiscal year was largely influenced by two circumstances. First, certain investigations commenced prior to the fiscal year, and in most cases during preceding administrations, were uncompleted and necessarily demanded first attention. Second, about the middle of

the fiscal year definite steps were taken by the legislative branch of the Government to establish a Federal Trade Commission and to merge the Bureau of Corporations therein, as stated above, and to enact supplementary antitrust legislation. This situation made it seem expedient for the Bureau to devote a considerable part of its attention to the study of economic and legal problems connected with the proposed legislation, and to the arrangement of its plans so as to be of greatest service to the proposed Trade Commission, if established.

Work Pending at the Beginning of the Year.

Several investigations commenced by the Bureau in prior years remained uncompleted at the beginning of the fiscal year covered by this report, namely, lumber, tobacco, agricultural implements, State corporation taxation, fertilizer, and petroleum. Work on all except the last two was initiated before the present administration.

Substantial progress was made in all of these investigations, and, except for State taxation of corporations and the last two investigations just mentioned, they were nearly completed during the fiscal year under consideration. A more definite statement of the matters reported on by the Bureau during the fiscal year is given below.

New Work Undertaken.

Apart from a general investigation of certain legal and economic problems relating to proposed legislation, referred to above, which included a study of foreign legislation on trusts, etc., certain new investigations were initiated by the Bureau during the fiscal year.

Among the most important of these was an investigation into the economic character and effects of the system of resale price maintenance, i. e., the practice of manufacturers and distributors of fixing the price at which retailers or other dealers in their products shall sell to consumers or other purchasers.

A study was also commenced of the conflict of State laws relating to foreign corporations. The wide divergences in the prerequisites for doing business in the various States have often seriously hampered and restricted the business world. A comparative study of this subject and the preparation and suggestion of a model system of regulation, it is thought, would tend to facilitate the establishment of a more uniform system which would be of great benefit to the business world and the public at large.

An investigation of the lumber and shingle industry in the State of Washington with regard to the general economic conditions was initiated and completed.

A similar but more elaborate investigation was initiated into the general economic conditions in the beet-sugar industry.

In accordance with a resolution passed on March 28, 1914, by the United States Senate, an investigation was commenced with respect to alleged discrimination in the prices paid for crude petroleum in the Healdton or Ardmore field of Oklahoma. This investigation was necessarily connected, to a large extent, with the one initiated just before the beginning of the fiscal year into the petroleum industry with respect to the prices paid for Oklahoma crude oil.

The Bureau also had in contemplation a comprehensive study of the fundamental problems of the efficiency of trusts; that is to say, of the determination of the question whether, from the standpoint of business profits, and also from other standpoints of social welfare, the trust form of organization was really, as is often alleged, socially and economically efficient. While some tentative work was done by the Bureau in this connection during the fiscal year, the lack of an adequate appropriation made it impracticable to organize a comprehensive investigation of this very large subject. Nevertheless, a fairly comprehensive survey of the industrial field has been made, which will furnish a basis for this work if the appropriation is provided therefor.

Work Completed.

With respect to the investigations commenced during previous administrations, practically all data necessary for the final reports were collected and digested before the end of the fiscal year, although the final reports thereon have not in all cases been completed at the present date.

During the fiscal year a special report on taxation was issued, supplementing previous reports on State taxation of corporations and covering the taxation movement throughout the United States during 1912. Subsequent to the close of the fiscal year, namely, on September 8, another report on taxation was issued covering the systems of corporate taxation in the Mountain and Pacific Coast States.

A report was issued during the fiscal year in connection with the lumber investigation regarding conditions of production, wholesale distribution, and prices of lumber. The results of the investigation into the shingle and lumber industry in the State of Wash-

ington were also reported on. Subsequent to the fiscal year further reports in connection with the lumber industry were issued relating to the concentration of the ownership of the timber resources of the country in particular localities and the concentration of land ownership among large timber owners.

The work of the Bureau has been so planned as to complete a large part of the investigations now on hand before its merger into the Federal Trade Commission by the publication of additional reports on tobacco, lumber, farm implements, taxation of corporations, petroleum (Healdton oil field), conflict of State foreign-corporation laws, and trust legislation.

The work of the Bureau during the fiscal year was by no means wholly confined to investigations which are the subject matter of the Bureau's reports. Not only was considerable assistance given to other branches of the Government service, through details of members of the Bureau's staff, but also extensive work was done of a statistical, economic, and legal character, with a view to aiding Congress, particularly in connection with tariff and trust legislation.

BUREAU OF STANDARDS.

Functions.

While the work of the Bureau of Standards covers a wide range of scientific work in physics, chemistry, and engineering, touching on the one hand the interests of the individual consumer and on the other those of the manufacturer, and enters directly into technical practice and into legislation, the work is primarily the development of standards. Standardization involves standards of measurement, standard values of technical constants, standards of quality, and standards of mechanical performance. Their complexity is due to the exacting demands of modern industrial and scientific work. The principle of standardization, which has become so powerful a factor in industry, has itself become the subject of searching analysis.

Standards of measurement are those in terms of which units of measure are defined. They underlie every indication of quantity or dimension, whether of matter, time, space, or energy. Upon such standards rests the availability of technical data for industrial application.

Standard values of constants are those measured data, determined with as high precision as possible, which serve to control industrial process. For example, every engineer must have handbooks giving the data which he uses daily in his work—designing structures, laying out industrial plants, and planning industrial processes. The effectiveness of the work of the engineer and of the industries which he serves is in direct proportion to the correctness of the data available. The determination of such standard data is an important function of the Bureau of Standards.

Standards of quality are quite modern in the scientific sense. Such a standard may be in the form of a sample of an ideal material, but are usually a description of the properties of an ideal material. In the latter form they are given as technical specifications. In proportion as these technical specifications are given in units of weight and measure describing the properties which insure the desired quality, the specification becomes a standard of quality. The establishment of such standards de-

of the idea of units and standards of measurement of the simpler forms.

The work of practically all divisions of the Bureau has been at times called upon to meet the demands for information and advice on these subjects. Engineering investigations have been undertaken in connection with standards for illuminating gas and electric service, particularly in connection with the mitigation of electrolysis, and with the promotion of safety in electric practice. An interesting point in connection with the gas standards is that at different altitudes different specifications are required to secure the same heating value in a gas, since this depends upon its mass and composition rather than its volume merely.

The Bureau has been requested by State and city governments and public-service commissions to assist in research designed to secure more efficient regulation of particular utilities. It is gratifying that the National Government has available the laboratory facilities for submitting to rigid laboratory experiment the various technical questions connected with this subject.

The Bureau during the year has continued its advanced work and field investigation of the methods of electrolysis mitigation. Its laboratory investigations include the effects of electric current in underground pipes, tests of pipe covering, corrosion of metals in soils, and many other experimental phases. An electrolysis survey was made at Springfield, Mass., as a demonstration of what could be done in securing relief from electrolytic corrosion. The results thus far obtained have been very gratifying.

In connection with electric light and power service, the principal factors to be prescribed are quality and reliability, and the accuracy of meters that measure the current. These may be investigated by experiment and measurement, and the results will be of great value to the public, both the consumer and producer, by making the mutual understanding more definite, thus avoiding suspicion and inefficiency. The Bureau has issued recently a manual of safety rules in connection with life hazard involved in electric current distribution.

The Bureau serves in a cooperative and advisory capacity as to standards involved. In special cases the Bureau experts are asked to visit and study local conditions. The extent to which the regulation of public utilities involve laboratory work, field measurements, and standards is striking. Clear specifications for an efficient service refer in almost every paragraph to units of measure, measuring instruments, or standards. In gas service, for example,

the vital factors—quantity, candlepower, pressure, and quality—all are measurable and may be specified in units of measure. Standards may be set for each element so selected as to assure a uniformly efficient service. Each of the units has measured elements. For example, the measurement of candlepower involves the plan of testing, the unit of candlepower, the effect of atmospheric conditions, the bases of rating, humidity corrections, and correctness for air pressure. All these are measured details affecting the measurement of candlepower.

In the public-utilities work the Bureau has secured the ready cooperation of engineers, inspectors, and local government officials. The Bureau thus has available and is accumulating data and experience. It is enabled to tabulate and study such data and draft model regulations which have passed the critical scrutiny of the Bureau and the best experts in the country. This enables the utilities commissions to begin upon a technically correct basis. The Bureau aims to be in the highest degree helpful to the public, the public-utilities companies themselves, and the public-service commissions which regulate them.

Manufacturers, etc.

Practically every industry has its units, its special methods of measurement and measuring instruments designed for every kind of need. The Bureau aims to critically study the theory of such instruments with a view to pointing out sources of error. It also certifies the corrections to standards by which such instruments are constructed. It is equally necessary for the Bureau to examine the methods by which such measuring instruments are used; and by aiding the manufacturer to secure accurate measuring instruments, and to apply the most precise methods of measurement, the Bureau is aiding industry at fundamental points. Modern industry is effective in proportion as precision methods of measurement are applied to the details of industrial process.

The report of the Bureau for the year shows clearly the intimate connection between standardization and the industries. The engineering professions have appealed to the Bureau to investigate the adequacy of the formulas upon which the strength of columns are computed. At the request of the refrigeration engineers, the Bureau has begun the redetermination of the certain constants upon which their calculations are based; likewise, the fire-prevention interests have united in requesting that the Bureau

standardize the procedure for determining the fire-resisting properties of materials and the value of devices to be used in fire prevention. These are examples of the requests, continually being received from those concerned, to assist the industries in standardizing methods of measurement and testing, and in making researches involving precision measurements. The demand for higher precision is felt keenly at points where the economies and efficiencies to be secured are especially notable, such as the accurate knowledge of temperatures in metallurgy, ceramics, and similar industries; the location of stray currents from electric mains and their neutralization; the establishment of more precise color standards for use in specifying and reproducing definite colors in inks, dyes, and other products—these and many others emphasize the highly practical nature of precision measurements, a fact too often overlooked.

For the cement industry the Bureau's work in standardizing the testing methods has resulted in improved quality of the sieves submitted for test.

For the watchmaking industry the testing of the higher grade watches was begun, and the Bureau is prepared to undertake such tests regularly four times each year. The procedure and regulations were discussed in a conference of watch manufacturers held at the Bureau during the year.

Precise determinations of the density of commercial materials, such as oils, turpentine, milk, and cream, have been made.

The changes of dimension upon heating must be carefully considered by manufacturers. For this purpose the Bureau is studying the expansion of metals. One research gives promise of correlating the changes of length with corresponding changes in electrical resistance.

The standardization of aneroid and mercury barometers has been pushed vigorously during the past year. The importance of such instruments, particularly aneroids, is caused by their increased use in aviation and exploration. In some cases the ratings of aeroplanes depend upon the readings of aneroids.

The Bureau has done excellent work in standardizing the various heat-measuring instruments used in determining the heating value of fuels. The recent progress in the industrial handling of fuels has been in the direction of specifying the fuel value. To determine this heating value, instruments and methods must be accurate. After extended investigation the newer methods and instruments have been found capable of high precision.

In order to fix the temperature scale for very high temperatures, precise determinations of melting points are of importance. The Bureau completed an investigation of the melting points of the iron group, including the melting points of those metals used as alloys with iron in steel making. The publication of these results will aid metallurgists in temperature ranges where existing data is of uncertain precision.

The Bureau has determined the melting points of fire brick and materials used in connection with the high heats required in industrial processes. The aim of this work is to assist in developing the most refractory materials suitable for such work.

For the refrigeration industry numerous constants must be obtained. Among them the latent heat of fusion of ice has already been determined by the Bureau. Numerous other laboratory investigations are under way, which together are intended to place the most accurate values of the fundamental data required in refrigerating engineering in the hands of that profession.

Pure materials having definite heating values are issued by the Bureau at cost of production. These enable the user to check the value of his work and to standardize his instruments.

Ten separate lines of investigation in refrigeration were undertaken. Much of the apparatus had to be designed, as the work was in new fields. The experimental results will follow with reasonable rapidity but will require at least two years more. The Bureau has kept closely in touch with the needs of the refrigeration industries and with the National Association of Refrigeration Engineers.

In connection with the industries requiring high temperatures where ordinary thermometers can not be used optical methods must be adopted. The Bureau has made an investigation of the various types of so-called radiation pyrometers in order to standardize the methods of using these instruments. This will tend to greater accuracy and consequent increased efficiency in the industries concerned.

An interesting economic change in the gas industry is the present transition from the lighting value to the heating value as a specification of quality. After extended laboratory and field investigations, the Bureau has prepared a series of publications covering the field of gas chemistry and standard methods of gas testing. The Bureau reserves aim to assist the gas industries in standardizing their product and their methods of

testing for quality and quantity. The results of this work are of equal value to the public-service commissions, to which is intrusted the regulation of the relations between producer and consumer. Model gas regulations revised from time to time are published by the Bureau as a basis for commission regulation of this important public utility.

Educational Institutions.

The Bureau publishes three series of publications covering the entire field of the Bureau's work. It also distributes graphic charts of the two systems of measurement used in this country and special pamphlets giving a history of the standards and a description of the metric system. Many of the circulars dealing with methods of testing have been used as the basis of courses of study in certain educational institutions.

In accordance with the law governing the Bureau's work, the Bureau is permitted to standardize scientific instruments for State universities free of charge, and this work has grown. This service is highly appreciated, in view of the fact that much of the value of scientific investigation conducted at universities depends upon the use of accurate measuring instruments. The Bureau also assists State universities by the distribution of standard analyzed samples to be used as auxiliary material in teaching quantitative analysis in courses in technologic chemistry. Conferences of physicists, including instructors from the various universities, are held annually, and in connection with the last meeting an exhibit of scientific measuring instruments and other apparatus was held which proved of great interest and value to all concerned.

The Bureau cooperates with educational institutions in conducting investigations by its readiness to give data and occasionally to furnish materials if such are not obtainable elsewhere, and also in some instances to loan facilities.

Work for State Governments.

The Bureau assists the State legislatures when called upon in connection with the technical details of legislation affecting measurements. These include the units, standards, measuring instruments, and methods of measurement of the various public utilities such as electric light and power service, gas, water, and similar utilities, as well as all questions affecting the inspection of trade weights and measures. In many cases the means to secure such

technical data are not available except at the Bureau. The various interests concerned, including the public-service corporations themselves, have requested the Bureau's cooperation in connection with the standardization of these utilities. The Bureau is an unbiased institution, ready to serve all concerned, and in general its work is done and its decisions reached only after the fullest consultation with all interested and after consideration of all sides of the subject. In other words, the Bureau aims to take up mainly such questions as may be settled by laboratory experiment or by direct measurement.

The Bureau of Standards has tested the standard weights of 16 States, which is an indication of the growth of interest in public inspection in the States.

The Bureau undertook to organize an inspection department of weights and measures for the island of Porto Rico, and this was completed during the year with signal success. This service was undertaken at the request of the War Department. The value of establishing at the outset a model system of inspection can hardly be overestimated.

The conference of State officials, referred to above, held at the Bureau of Standards to discuss the State administration of weights and measures inspection was the most successful in the history of these conferences. The wisdom of these conferences is shown by their mutual value in acquainting the Bureau with local conditions and familiarizing the new State officials with the standardization and testing work of the Bureau of Standards.

Precision Standards.

The need for standards of length, mass, capacity, heat, light, and electricity is now generally appreciated. Continual care and laborious experimental work is often needed to maintain many of these standards. In many cases the cooperation of many countries was needed—for example, in the case of the standards of length and mass. In others, the standards are kept at constant temperatures, such as the standards of electromotive force, or under fixed conditions of moisture, humidity, or pressure. In all cases, whenever possible, the Bureau aims to steadily improve the precision standards or the methods of maintaining or using them.

In quite a different order of activity, new kinds of standards are being developed; for example, standards of quality and standards of performance. These standards are still in the initial stages, but will eventually become of supreme importance in

furthering industrial advance. The keen interest in recent years in standard specifications is an index of what must eventually extend to every material, device, machine, or process in industry.

The standards of quality for materials must be fixed, so that the best quality suitable for each use may be clearly specified. The standards of performance of devices and machines must be so fixed that by them the efficiency may be judged. In recent years energy has become a commercial product and is distributed in various forms. Electric energy, for example, may be delivered under various pressures, and may be direct or alternating current, and in the latter case may vary in frequency. The importance, therefore, of clearly specifying the form in which energy shall be delivered makes it a technical matter involving accurate measurements. Specifications for electric current covering both quality and quantity may often be made even more exact than for materials.

It has been the aim of the Bureau to keep apace with the technical needs for the more advanced forms of standards. Evidence is not wanting that industry has entered upon the stage where such advanced standards are indispensable.

New Standards.

The high economic and scientific value of radium lead the Bureau to acquire suitable "radium standards" for measuring the radium content of samples intended for sale or technical uses. During the year many samples of radium materials have been certified for the public by comparison with the sealed radium standards of the Bureau.

A new kind of standard was established at the Bureau during the year, namely, a standard of radiation. The new standards of radiation are incandescent lamps, the intensity of radiation of which was measured in terms of the simple units of measure by which energy is defined. The standards met with instant demand from investigators here and abroad in the field of radiation research.

It is of interest to note that the Bureau distributed at cost nearly 300 standards for heats of combustion—naphthalene, benzoic acid, and cane sugar—each of highest purity and definite heating value, certified by the Bureau. The instruments and methods used in testing the heating value of fuels may be readily standardized by these standard materials. They bear the same relation to fuel testing that standards of length bear to surveying.

Standards of melting points are being planned to aid metallurgists and others in standardizing the readings of their high-temperature measuring standards. Other optical standard materials include pure sugar for finding the 100° point in saccharimetry, rare gases for obtaining light of specific wave lengths, material of certified and defined color for use in butter and oil standardization.

The 100° point in saccharimetry is the scale reading for perfectly pure sugar. It is analogous to the length of the day as fixing the unit of time—the second. The universally accepted value of the 100° point was found by the Bureau to be in error by about 1 part in 1,000. The Bureau's precision determination of this point, now completed, is a distinct contribution to sugar testing and polarimetry.

The Bureau is measuring certain wave lengths of light with the highest possible precision for use as standards. The use of known wave lengths of light is just entering technical work, but their value in the study of the stars and of the sun can scarcely be overestimated. Upon them are based the measurements of stellar motion in the line of sight. In the study of the sun the same principles are applied in an even more remarkable manner. It may almost be said that a knowledge of the wave lengths of light has revolutionized astronomical and solar research. The extent of possible applications of precision measurements with light waves is almost unlimited. The work of the Bureau in this field is to cover as fully as possible the fundamental determinations of standard waves of monochromatic light, so that the results may be available for direct application in scientific and technical work.

Standards of color depend upon an accurate knowledge of the intensity and wave length of the component colors. One method of specifying color defined a standard in terms of the wave length of the dominant hue and the percentage of white light present. Spectroscopy bears somewhat the same relation to light that chemical analysis bears to materials. Spectrometry includes the determination of colors (wave lengths) present in any light, and the intensity of each. The instrumental equipment required in establishing color standards must therefore be accurate and based upon theoretically sound optical principles. Color standards have important and widespread applications in the industries making or using dyes, inks, paints, illuminants, textiles, paper, and clay products, and in many branches of science as well.

Government Testing Bureau.

The various branches of the Government have increasingly availed themselves of the facilities offered by the Bureau for testing, until during the past year about 90 per cent of the Bureau's testing was for the Government departments. The Bureau has thus become, in fact, the testing laboratory of the Government, having performed about 100,000 tests during the year for the Government departments. It aims to serve the scientific and other bureaus as to questions affecting units, standards, measuring instruments, and methods of testing of materials, devices, and apparatus, for which work the Bureau is specially fitted by equipment, facilities, and personnel to render expert assistance. This work is carried on in such a manner that the experience gained may be utilized in drafting improved specifications; that is, in developing true standards of quality, designed to place Government purchases on a scientific basis as regards quality.

The Bureau has tested a large number of sets of test weights for the Post Office Department to be used by their inspectors in verifying the scales in use in that Department, and has inspected the scales manufactured for the Postal Service to ascertain whether they are satisfactory for their intended use.

The importance of chemical tests and their correlation with service behavior has increasingly engaged the attention of the Bureau experts. The Bureau has conducted approximately 10,000 chemical tests of materials, for practically all the Government departments. By supplementing the chemical analysis with physical tests, it is frequently found possible to select the materials which would best meet service conditions, and to specify such material in units of measurement.

The Bureau has made special studies of the paper, ink, and binding cloth used in Government documents, and the same are now purchased under specifications and submitted for test. During the year the Bureau published methods of analysis of printing inks which have been found adequate.

Both the manufacturer and the Government gain by more definite specification of the properties of the materials desired. It is the growing belief that this is possible to an extent little realized at present. The minute specifications of performance of instruments are examples of a method of securing efficient equipment which will doubtless be applied in the future to materials and services of all kinds.

The useful character of the service being rendered by the Bureau in testing structural materials (nearly 9,000 tests during the year) is evident when it is remembered that by this systematic testing of materials before use the durability of Government construction work, and its efficiency and safety, are guaranteed as fully as the state of the arts allow. The many rejections of unfit material are a partial index of the defective construction that would have been possible without such testing. This work leads directly to the adoption of standard specifications for materials for all purposes, a result which will be of benefit not only to the industries concerned but to the entire public.

Information.

A most important service which the Bureau renders is in furnishing to the public, to the various industries, and to the Government bureaus technical information on subjects within the Bureau's field. During the year thousands of letters were received requesting information of the most varied character as to standards and methods of measurement.

The requests come from a wide range of sources—Government offices (city, State, and national), public-service corporations and commissions, industrial laboratories and plants, commercial houses engaged in foreign trade, consulting engineers, educational institutions, and the general public. The replies range from a brief answer to a carefully prepared report, depending upon the importance of the question involved and the service to be rendered.

In many cases the inquiries emphasize the need of information and are followed by new publications prepared on the subjects within the Bureau's field, but upon which the data are either unavailable elsewhere or widely scattered in technical literature. The inquiries thus serve partially to guide the Bureau in selecting topics for circulars based upon the relative urgency of the subjects pressing for publication. These printed circulars then become standard replies to many hundreds of the letters received annually.

In many cases the adoption of methods in the industries depends upon the Bureau's reply. The Bureau is often enabled to suggest means of securing improved economy and efficiency in industrial processes. In other cases the Bureau prevents costly experiments, and minimizes the chance of failure, especially where standards or measures are involved. The latest methods of measurement and other data are usually known or available to

the Bureau, which thus serves as a clearing house for technical information as to materials, units, standards, instruments, and methods of measurement. An unique aspect of this work is that without police power to enforce its decisions the Bureau exerts so widespread an influence, by virtue of its unbiased attitude and its carefulness in arriving at accurate results. The success with which the Bureau is making its results available to the public through correspondence, consultation, and publication is recognized by the national technical societies through which so largely the work of the Bureau enters current technical practice.

Materials and devices are often advertised and sent through the mails which are properly subject to a fraud order. Extravagant claims induce investment by those with limited means. The Bureau has rendered frequent service in showing the fraudulent character of such inventions. Inventors apply to the Bureau for the testing of proposed inventions which are utterly unscientific. In many cases vast sums have been wasted on impossible schemes. The Bureau tries to convince such inventors of the hopelessness of their attempt. In such cases the Bureau measures the effect claimed and places the facts before the inventor. On the other hand, the Bureau is constantly assisting intelligent inventors, where its advice is sought, on matters lying within its field.

The Bureau's Influence in Establishing Scientific Research and Methods in the Industries.

Another important function of the Bureau is the stimulus which it has continually given to the establishment of industrial-research laboratories. Since the establishment of the Bureau this has become a distinct industrial movement in this country. Many large corporations now have well-equipped laboratories for scientific research. These utilize the work of the Bureau and have increased the applications of science to industry to a notable extent. The Bureau has shown the need for technical research by calling attention to unsettled problems, by pointing out the values of specific researches, and by actual instances of service rendered, so that it is not surprising that its influence in this respect has been widespread.

Buildings.

Attention is again called to the necessity of properly housing the structural materials work, especially the branch of the work at Pittsburgh, and which is temporarily located in buildings of the

War Department at the arsenal grounds. These buildings are entirely unsuited for the purpose either as to location or character, and the Bureau has considered it unwise to expend any funds on their preparation as laboratories other than the barest necessities. Furthermore, the War Department has repeatedly asked for the vacation of the building.

Every effort is being made by the Bureau to place its structural work on a basis commensurate with its importance. Considerable heavy equipment has been accumulated both at Pittsburgh and Washington, and more will be needed. Good work is being carried on at both places, but the large testing machines, furnaces, and other heavy equipment should be brought together in a building designed for the purpose and sufficiently large to accommodate all heavy equipment of this kind. It is uneconomical and inadvisable to proceed with the installation of permanent heavy equipment in temporary quarters.

Additional Ground.

The recent opening of Van Ness Street north of the Bureau at a place not adjoining the Bureau's grounds makes it necessary to secure the small strip of land between that street and the north boundary of the Bureau's site. Efforts were made without avail to secure the location of the street in a position adjoining the Bureau's property. It is also advisable to secure the narrow strip between the Bureau and Tilden Street on the south.

Investigation of Clay Products.

The pottery, brick, tile, terra cotta, and other industries engaged in the production of clay products are greatly in need of reliable and authoritative data concerning the properties of these products and the materials which enter into them. In few industries is there any greater opportunity of the improvement by the application of precise measurements and of scientific knowledge of the nature of the products. An item has been included in the annual estimates to provide for this work.

Transverse Testing Machine.

Attention is again called to the necessity of adding to the Bureau's equipment a large transverse testing machine capable of testing the transverse strength of full-sized steel girders used in bridges and buildings; also brick, stone, and concrete arches, floor constructions, etc. The late Alfred Noble, one of the most promi-

nent engineers that America has produced, made the following statement concerning the necessity for the construction of such a machine:

The use of steel and concrete in girders in the construction of bridges and buildings is increasing rapidly. The calculations of strength of such girders are to a large extent based on theory, not well checked by actual tests; such tests as have been made were on small girders, and the value of the results in determining the dimensions of large girders such as are now in common use is doubtful. It is questionable whether, on the one hand, many structures in daily use are not perilously near the breaking point; or, on the other hand, whether the structures are not built unnecessarily massive and costly.

There is therefore great need of a large testing machine for actually testing the strength of girders of large size. Such a machine, operated under the direction of the Bureau of Standards, would soon repay its cost by inducing more economical and safer construction.

Since transmitting the original estimate for this machine much additional evidence has been secured, all indicating the great need on the part of engineers for data that can only be obtained by a large machine of this character. A sum sufficient to enable the Bureau of Standards to begin its design and construction has again been included in the estimates.

BUREAU OF THE CENSUS.

During the fiscal year the Census Bureau brought to completion the deferred work of the Thirteenth Decennial Census; began various special compilations of Thirteenth Census statistics; commenced and brought well toward completion the preparation of a "statistical atlas" based on data collected at the Thirteenth Census; tabulated and published data relating to the dependent, defective, and delinquent classes; conducted the decennial inquiry on wealth, debt, and taxation; completed its quinquennial canvass of electrical industries and a considerable part of the work of compiling the statistics obtained; began preparations for its quinquennial census of manufactures, the field work for which will begin early in the calendar year 1915; compiled and published the biennial Official Register of the United States; carried on its regular annual investigations covering vital statistics, statistics of cities, and cotton production, distribution, and consumption; completed the annual forest-products inquiry relating to the calendar year 1912; made its semiannual collections and publications of statistics of stocks of leaf tobacco held by manufacturers and dealers; and answered numerous mail requests for information contained in its records.

COMPLETED WORK.

Deferred Thirteenth Census Work.

During the fiscal year Volumes I, II, III, V, VIII, X, and XI of the final reports of the Thirteenth Census were issued, and Volume IV was ready for distribution on July 7, 1914.

The report on Mines and Quarries (Vol. XI) was issued December 30, 1913. Its scope, as originally planned, was considerably curtailed in order to avoid greater delay in publication.

The report on Occupations (Vol. IV), as already stated, was ready for distribution July 7, 1914, and four bulletins relating to occupations were issued in July and August, 1914.

In addition to the reports mentioned above, there were issued during the fiscal year three editions of the Abstract, with supplements for Alaska, Hawaii, and Porto Rico, respectively; 16 reprints,

in bulletin form, of chapters in Volume I (Population—General Report and Analysis); 12 reprints, in bulletin form, of chapters in Volume V (Agriculture—General Report and Analysis); 1 reprint, in bulletin form, of a chapter and table in Volume VIII (Manufactures—General Report and Analysis); 40 bulletins on manufacturing industries, which later formed sections of Volume X (Manufactures—Reports for Principal Industries); 1 bulletin relating to manufactures in metropolitan districts, which later formed a section of Volume X; 1 bulletin relating to iron mines, which later formed a section of Volume XI (Mines and Quarries); and 1 special bulletin relating to the stability of the agricultural population.

Forest Products.

The annual collection of statistics of forest products was inaugurated in 1906, in accordance with an order of the Secretary of Commerce and Labor, on the initiative of the Forest Service of the Department of Agriculture. The inquiry, although never authorized by Congress, was continued by the Bureau of the Census, in cooperation with the Forest Service, from 1906 until 1912, when it was abandoned by the Census Bureau upon the recommendation of the expert special agents (former officials of the Census Bureau) who were appointed by the Director early in the fiscal year to devise plans for expediting the delayed work of the Bureau and to make recommendations for such changes as seemed desirable. The recommendation made by these expert special agents with reference to the forest-products inquiry was as follows:

That the annual compilation of the statistics of forest products be abandoned. There appears to be no authority of law for an annual inquiry of this character, which the records show to have cost from \$20,000 to \$40,000 a year.

In view of the importance of these statistics and of the demand for them from large consumers of forest products and others interested in the conservation of natural resources, the Forest Service undertook the task of collecting the figures for 1913. It has been decided that the Census Bureau collect the figures for 1914 in connection with its regular quinquennial census of manufactures, which will cover that year; and an effort will be made to secure the passage of an act or resolution of Congress authorizing the Bureau, in cooperation with the Forest Service, to continue the annual collection of these statistics.

The work done during the fiscal year included the completion of the canvass covering the calendar year 1912, the com-

pilation of the results, and the preparation of the report, an octavo pamphlet of 60 pages, which was issued February 7, 1914.

Official Register of the United States.

This publication, a quarto volume of 876 pages, was compiled during the first half of the fiscal year, and was ready for distribution January 7, 1914. As a result of suggestions made by the Department of Commerce, the urgent deficiency act approved October 22, 1913, provided for the discontinuance of the publication of Volume II of the Official Register, relating to the Postal Service. The act also provided for the omission of the list of ships and vessels belonging to the United States, formerly included in Volume I. This legislation greatly simplified the preparation of the Official Register and very materially decreased the expense of the work.

Legislation authorizing the adoption of the following plan with reference to the preparation and publication of the Official Register of the United States has been recommended to Congress:

(1) The establishment of a card directory, prepared and maintained by the Civil Service Commission from information furnished by the executive departments and independent offices, showing the name and status of every person in the Government service except the officers and enlisted men of the Army, Navy, Marine Corps, and Revenue-Cutter Service. Lists of officers of the Army, Navy, and Marine Corps are already published annually in the Army Register and Navy Register, issued by the War and Navy Departments, respectively.

(2) The elimination from the Official Register of detailed lists of all employees, by name.

(3) The publication annually by the Bureau of the Census of an Official Register containing: (a) A list of all employees of the Government (except officers and enlisted men in the Army, Navy, Marine Corps, and Revenue-Cutter Service) whose duties are of an executive, supervisory, technical, or professional character, and whose compensation is \$2,000 or more per annum; (b) statistics relating to the Government service, to be prepared from the Civil Service Commission's card directory.

This recommendation was mentioned in the annual report of the Secretary of Commerce for the fiscal year 1913, as coming from the Director of the Census, and was made by the Director in his annual report for that year. The proposed plan, if adopted, will result in very material saving to the Government, will at the same time

preserve all the valuable features of the present Official Register, and will provide for a complete and up-to-date record of the entire personnel of the Government in one central office (the Civil Service Commission), from which the Census Bureau will be able to prepare accurate statistical statements when called upon to do so by the President or by Congress.

A bill substantially embodying the foregoing plan (except that \$1,500 instead of \$2,000 was fixed as the lowest compensation of employees whose names should be included in the Official Register) was introduced in the House of Representatives on August 8, 1913, by Hon. W. C. Houston, of Tennessee.

CURRENT WORK.

Wealth, Debt, and Taxation.

This is one of the most important of the Bureau's "intercensal" inquiries. A portion of the data for the current series of bulletins, which relate to the fiscal year ended June 30, 1913, was obtained from printed reports of the Federal Government and of States, cities, and counties; the remainder was gathered by personal canvass. The office work on this investigation was commenced in October, 1913. The field work began March 21, 1914, and during the period from that date to June 30, 1914, the employees in the field numbered, on the average, 86.

Work is progressing rapidly and satisfactorily on this inquiry. Two bulletins—"National and State Indebtedness and Funds and Investments" and "Taxation and Revenue Systems of State and Local Governments"—have been issued since the close of the fiscal year 1914; another, "National and State Revenues and Expenditures, 1913 and 1903; and Public Properties of States, 1913," will come from the press in a short time; and four more—"County and Municipal Indebtedness, 1913, 1902, and 1890; and Sinking Fund Assets, 1913," "County Revenues, Expenditures, and Public Properties, 1913," "Municipal Revenues, Expenditures, and Public Properties, 1913," and "Assessed Valuation of Property and Amounts and Rates of Levy, 1860-1912"—will be issued late in 1914 or early in 1915. The final bulletin, "Abstract—Wealth, Debt, and Taxation," will contain an abstract of the statistics presented in the seven bulletins just named, together with an estimate of the true value of all property in the United States, both subject to and exempt from taxation. This final bulletin will be issued early in 1915—about a year and a half from the commencement of the office ¹ about a year

from the commencement of the field work. In this connection it may be stated that the field work on the last preceding inquiry on this subject was commenced March 1, 1903; that two bulletins, relating to municipalities, were issued August 31, 1905, and July 12, 1906, respectively; and that the complete report was ready for distribution May 7, 1907—more than four years from the beginning of the field work. No data are available from which to make anything like an exact comparison of the two investigations with respect to cost; but there has been a very material saving in this respect, approximately \$150,000, due in part to the fact that some 15 or 20 per cent of the statistics collected at the present inquiry were obtained from published reports of the various governmental units, the work being done in the office at Washington instead of by personal canvass in the field, and in part to the early completion of the investigation, which was finished before the close of the calendar year 1914.

Electrical Industries.

Statistics of electrical industries are collected quinquennially by the Census Bureau. The current inquiry relates to the calendar year 1912. The field work for this census was begun in January, 1913, and was completed in November of the same year. The field employees numbered, on the average, 27. Press summaries of the statistics were issued from time to time as the tabulation progressed, beginning in December, 1913, and two bulletins were issued in May and June, 1914, respectively, the first presenting the principal data in regard to telephones and telegraphs and the second giving the more important statistics relating to central electric light and power stations and street and electric railways. The final reports will be issued late in 1914 or early in 1915 in the form of two quarto volumes. One, entitled "Central Electric Light and Power Stations, and Street and Electric Railways," and comprising nearly 600 pages, will include in more detailed form the statistics contained in the bulletin under the same name. The other, entitled "Telephones and Telegraphs," and comprising about 250 pages, will contain in amplified form the data given in the bulletin on telephones and telegraphs, together with a section showing telephone rates throughout the United States. Statistics relating to municipal electric fire-alarm and police-patrol signaling systems will also be included. Comparative statistics will be given in each report, covering two five-year periods (1902-1907 and 1907-1912), thus bringing out definitely and clearly the enormous growth of electrical industries during the past decade.

Dependent, Defective, and Delinquent Classes.

Under this heading come the Bureau's decennial reports on benevolent institutions, paupers in almshouses, the insane and feeble-minded in institutions, prisoners and juvenile delinquents, and the blind and deaf. The report on benevolent institutions, a quarto volume of 411 pages, was published during the year, and three bulletins, relating, respectively, to insane and feeble-minded in institutions, to paupers in almshouses, and to prisoners and juvenile delinquents, have been issued, which will later be followed by the final reports on these classes. With respect to the insane, feeble-minded, and paupers, all the fundamental data are presented in the bulletins already issued; but the final reports, now nearly ready for publication, will present in addition a discussion and analysis of the statistics, including ratios, percentages, and diagrams, while the final report on prisoners and juvenile delinquents will also contain certain fundamental data not heretofore published. This volume will be ready early in 1915.

These reports will be more complete and comprehensive in scope than any which the Bureau has previously published on these subjects. The report on the insane in particular, which has been submitted in proof to well-known authorities on insanity, has been commended as representing a marked advance in the statistical treatment of that subject.

A summary of State laws relating to the care of the dependent classes has just been issued.

Statistical Atlas of the United States.

This publication was prepared during the fiscal year and will be issued this month. It will be a quarto volume containing 99 pages of text and 503 plates carrying maps and diagrams presenting graphically the more important facts brought out by the various decennial and other census inquiries. The current statistical atlas covers the subjects of population, agriculture, manufactures, mines and quarries, cotton production and consumption, financial statistics of cities, vital statistics, religious bodies, marriage and divorce, and insane in hospitals. The purpose of this volume is the presentation of the more significant statistics collected by the Census Bureau in such form that they may be readily grasped and understood.

Special Compilations of Thirteenth Census Statistics.

After the completion of the work of a decennial census the Bureau makes various special compilations of the statistics col-

lected at that census which it would not be feasible to include in the regular reports. Such compilations of Thirteenth Census material include a report on Indians; supplementary occupation statistics; bulletins on Chinese and Japanese in the United States, the stability of the agricultural population, and ages of farmers; and a report and bulletin on Negroes in the United States.

The Indian report, a bound volume of several hundred pages, will be issued next month. A 25-page bulletin relating to the Indian population was published in June, 1913.

Work is now under way on a special report presenting supplementary occupation statistics. This report will include the following subjects: Distribution of all persons occupied, by sex, according to color or race, nativity, and parentage, and age periods in detail; occupations of women; occupations of children; occupations of foreign-born workers according to country of birth; occupations according to class of worker; and unemployment data, for wage workers only.

The Bureau has just issued a 50-page bulletin in which are brought together all the statistics regarding Chinese and Japanese in the United States which are found in the Thirteenth Census reports on Population, Occupations, and Agriculture. There has been a great demand for this bulletin from the Pacific Coast and Rocky Mountain States.

Two special bulletins relating to the agricultural population have been issued—one, of 22 pages, entitled "Stability of Farm Operators, or Term of Occupancy of Farms," and the other, of 35 pages, entitled "Age of Farmers, by Color of Operator, Character of Tenure, and Size of Farm." The former was ready for distribution in June and the latter in August, 1914.

Early in August, 1914, the Bureau began the preparation of a special report relating to Negroes in the United States. A preliminary bulletin will soon be issued, and it is expected that the complete report will be published about March 1, 1915. It will show, for the Negro race, the principal census data relating to population, occupations, agriculture, mortality, membership in religious bodies, and marriage and divorce. The figures are being compiled from census publications or other material already in possession of the Bureau. A similar report, based on the census of 1900, was one of the most popular of the Bureau's publications.

Vital Statistics.

During the fiscal year ended June 30, 1914, the Bureau's annual mortality reports for 1910, 1911, and 1912 were issued. These

reports, and particularly those for 1910 and 1911, had been delayed because of the pressure of the Thirteenth Census work. In order to expedite the publication of the 1912 report, the tables showing detailed death rates were omitted. These rates are included in the report for 1913, which has just come from the press.

The Index of Joint Causes of Death, intended for use of registrars of mortality statistics, showing the assignment to the preferred title of the International List of Causes of Death when two or more causes are simultaneously reported, has recently been issued. This publication, an octavo volume of 308 pages, has been "printed as proof," in order to enlist constructive criticism from registrars and others concerned or interested in the recording, transcription, compilation, and publication of mortality data.

An important piece of work now in progress is the preparation (for the first time by any Federal bureau) of a series of life, or mortality, tables, based on the population and mortality statistics of 1900 and 1910, showing "expectation of life" for various elements of the population—male and female, white, Negro, urban, rural, etc.—in the original registration States as they existed in 1900, taken as a group. Certain of these States, ranking high in population, such as New York, Massachusetts, and Michigan, will also be represented individually. These tables are similar to those used by life insurance companies, and their preparation, which is under the charge of Prof. James W. Glover, of the University of Michigan, involves actuarial computation of an intricate character.

During the fiscal year the States of Georgia and South Carolina passed satisfactory death-registration laws, based upon the "model law" recommended by the Bureau of the Census. The enactment of this legislation was due in large part to the efforts of the Bureau.

Statistics of Cities.

The report on general statistics of cities for 1909, a quarto volume of 197 pages, was in page proof on June 30, 1913, and was issued soon thereafter. Up to 1909 this report had been issued biennially, but, owing to the necessity for concentrating the force of the office as far as possible on the work of the Thirteenth Census, the report for that year was considerably delayed, and it was decided not to issue it for 1911 and 1913. The annual reports on financial statistics of cities, however, carry a few statistics of a general character.

The 1911 report on financial statistics of cities of 30,000 and over had also been delayed by the Thirteenth Census work. This

report, a quarto volume of 401 pages, was completed November 15, 1913, and was ready for distribution December 8, 1913.

The 1912 bulletin on financial statistics of cities of 30,000 and over was completed December 15, 1913, and was ready for distribution December 22, 1913. The expert special agents (former officials of the Census Bureau) who were appointed early in the fiscal year to devise plans for expediting the publication of the reports of the Thirteenth Census and of such annual reports as are issued by the Bureau recommended the preparation of this abridged report, in bulletin form, on financial statistics of cities, and the omission of the regular report for 1912. After the completion of the bulletin, however, it was found practicable to issue the regular report. This publication, a quarto volume of 410 pages, was ready for distribution June 6, 1914.

The 1913 report on financial statistics of cities having a population of 30,000 and over was completed during the fiscal year ended June 30, 1914, and was ready for distribution early in September. This publication was issued in the form of a quarto bulletin of 73 pages.

Cotton and Cottonseed.

During the year the Bureau collected and published its regular preliminary and annual statistics relating to cotton ginned, to cotton consumed, imported, exported, and on hand, and active cotton spindles, and to cottonseed and linters. There are now 10 preliminary reports on cotton ginned issued each year, beginning with that relating to August 31 and ending with that for February 28 of the following year. The preliminary reports on stocks held and consumption of raw cotton by warehouses, mills, etc., are published monthly during the entire year. Three preliminary reports on cottonseed crushed and linters obtained are issued each year, the first relating to November 30, the second to December 31, and the third, covering the season's crush, to February 28. These preliminary reports are all distributed in card form. The reports on cotton ginned are published approximately 8 days, those on stocks and consumption approximately 14 days, and those on cottonseed and linters approximately 16 days after the dates to which they relate.

The Bureau also publishes annually two quarto bulletins, one relating to production of cotton, cottonseed, and cottonseed products, with condensed data regarding supply and distribution of cotton, and the other giving more detailed statistics as to supply

and distribution of cotton, together with data for active cotton spindles and exports and imports of raw cotton and its manufactures. The bulletin on the production of cotton and cottonseed products, relating to the crop of 1913, comprised 79 quarto pages and was issued in July, 1914. The bulletin on supply and distribution of cotton for the year ended August 31, 1913, contained 40 quarto pages and was issued November 1, 1913.

Hereafter but one annual cotton bulletin will be compiled. This bulletin will relate both to the production and to the supply and distribution of cotton, and will be ready for distribution about September 15.

Tobacco.

Under authority of an act of Congress approved April 30, 1912, the Bureau makes semiannual collections and publications of statistics of stocks of leaf tobacco held by manufacturers and dealers. The reports for the fiscal year 1914 relate to October 1, 1913, and April 1, 1914, and were issued, in card form, November 13, 1913, and May 9, 1914, respectively.

These statistics are collected almost entirely by correspondence, but the Bureau of Internal Revenue of the Treasury Department renders valuable assistance in correcting the reports and in obtaining returns from establishments which fail to respond promptly to the inquiries of the Census Bureau.

The Bureau's tobacco reports have been generally approved by those interested and have received but little adverse criticism. A special effort is made to publish the figures as soon as possible after the dates to which they refer, and it is gratifying to note that each report since the inauguration of this work has been issued more promptly than the preceding one. In fact, the last report, relating to April 1, 1914, was ready for distribution in only two-thirds the time required for the preparation and publication of the first one, relating to October 1, 1912.

In July, 1914, five representative tobacco planters, dealers, and manufacturers were given appointments as expert special agents and called to Washington for the purpose of discussing improvements in the method of collecting these statistics; and it is the intention to hold a similar meeting of these expert special agents immediately after the publication of the forthcoming tobacco report, which will relate to October 1, 1914, in order that they may examine and criticize the statistics and suggest such changes

in the work as may seem desirable. It is expected that substantial benefit will result from the adoption of some of the suggestions made by these tobacco experts.

Information Furnished by Correspondence.

In addition to the collection and publication of statistics along the various lines already mentioned, the Bureau handles numerous requests from local governments and from individuals for information of one kind and another. More than a thousand such requests for population data alone were received and answered during the year. A great many requests were also received for genealogical data and for transcripts of census records regarding ages of soldiers, to be used in connection with applications for pensions or increases of pensions.

PLANS FOR FUTURE WORK.

In addition to conducting the several annual inquiries already discussed, the Bureau of the Census will, in 1915, take its regular quinquennial census of manufactures and its first quinquennial census of agriculture.

Census of Manufactures.

This census, the field work for which will begin early in 1915, will relate to the calendar year 1914. Preliminary work, consisting largely in the preparation of index cards for listing the manufacturing establishments, was commenced in December, 1913, and will continue throughout the present calendar year. A special effort—which, it is expected, will be attended by a large measure of success—is being made to unify the Census Bureau's classifications with those of the Bureau of Foreign and Domestic Commerce, in order to make possible a closer approach to complete comparability of the former Bureau's statistics of manufactures and the latter's statistics of exports and imports.

Another feature of the preparatory arrangements for this census, and one which distinguishes it from preceding censuses, is the effort that has been made to secure the cooperation and assistance of prominent manufacturers and of representative commercial and trade bodies of all kinds. Letters have been written to such manufacturers and to all such organizations of which the Census Office has any knowledge, inviting cooperation and requesting suggestions, particularly in reference to the inquiries carried on the various special or supplementary schedules.

A trip was made during January, 1914, by the Director and the Chief Statistician for Manufactures, to Philadelphia, New York, and Boston, where conferences were held, with very gratifying results, with the leading commercial and industrial organizations of those cities; and a similar trip through the eastern North Central States, extending as far south and west as St. Louis, has been arranged for the latter part of 1914, from which equally satisfactory results are anticipated. Many of these organizations have, at the request of the Census Bureau, passed resolutions to the effect that they recognize the importance of the census of manufactures and will endeavor in every way possible to assist in and expedite the work.

The aid of Members of the Senate and House of Representatives, of the Department of Agriculture, of the Bureau of Corporations, and of State statistical organizations has also been enlisted.

In short, more has been done already, and will be done, in these directions in preparation for the census of 1915 than has been undertaken in connection with any preceding census of manufactures; and it is confidently expected that the results will be published more promptly and will be of greater value than ever before.

Census of Agriculture.

The Thirteenth Census act, passed in 1909, provided for a census of agriculture to be taken in 1915 and at 10-year intervals thereafter. This intercensal inquiry will be much more limited in scope than the agricultural inquiry made in connection with each decennial census of population. Estimates for the appropriation needed will be submitted to Congress at its next regular session, together with requests for such slight changes in regard to date of enumeration, scope, and method as may seem desirable at that time.

Statistics of Federal Employees.

The Bureau has under consideration the compilation of statistics of the executive civil service similar in scope to those in Bulletin 94, Statistics of Employees: Executive Civil Service of the United States: 1907. This work could be taken up in connection with the preparation of the next edition of the Official Register, which will relate to July 1, 1915, and the results could be published in bulletin form after the issuance of the Register. In

this bulletin the employees of the executive civil service, exclusive of postmasters and certain other specified employees, would be classified according to sex, race and nativity, age, marital condition, character of appointment with reference to the civil-service rules, character of work, period of service, compensation, State or Territory from which appointed, and military or naval service in the Civil or Spanish-American War.

There is a considerable demand for statistics of this nature, which are not now available in any Government publication. The extra data needed for their compilation could be obtained from the departments and independent offices, in connection with the preparation of the Official Register, at a comparatively small increase of expense; and it is believed that their usefulness would furnish ample justification for undertaking the work.

OFFICE FORCE.

The appropriation act for the fiscal year 1914 provided for 621 permanent employees of the Census Bureau; the number provided by the act for 1915 was 589. This reduction, with the consequent material decrease of expense, was due to the removal of the Bureau to the new Department of Commerce building and the consequent consolidation of its subclerical or labor force with that of the Department. No material change was made in the administrative and clerical force.

APPROPRIATIONS AND EXPENDITURES.

Financial Statement, Fiscal Year 1914.

Administrative:

Salaries for administrative places	\$34,963. 61
Salaries for Division of Correspondence and Mail	21,148. 48
Salaries for library	5,362. 60
Salaries for watch, labor, and char forces	25,740. 51
Rent	21,000. 00
Stationery	3,218. 32
Miscellaneous expenses	21,590. 69
Books and periodicals	490. 73

Total \$133,514. 94

Machine shop:

Salaries	10,739. 43
Materials, supplies, etc	34. 46

Total 10,773. 89

Geographer's Division: Salaries 20,697. 84

Thirteenth Census work:

Population—

Supervision.....	\$11, 291. 64
General and State reports.....	19, 141. 13
Occupations.....	114, 052. 44
Tenure of homes.....	31, 124. 56
Miscellaneous work.....	9, 546. 68
Total.....	\$185, 156. 45

Agriculture—

Supervision ^a	7, 780. 11
General and State reports.....	8, 553. 63
Color, tenure, and size.....	1, 243. 88
Plantations.....	194. 04
Irrigation.....	116. 66
Total.....	17, 888. 32

Manufactures—

Supervision ^b	9, 445. 77
Completion of manufactures reports..	11, 382. 36
Industrial districts.....	2, 281. 66
Mines and quarries.....	2, 541. 39

Total.....	25, 651. 18
Institutions.....	22, 715. 17
Revision and Results.....	16, 769. 30
Publications.....	9, 950. 28
Negroes in the United States.....	695. 56
Chinese and Japanese.....	216. 67

Total..... \$279, 042. 93

Annual investigations:

Cotton.....	257, 100. 03
Tobacco.....	10, 239. 29
Forest products.....	3, 670. 78
Electrical industries.....	73, 280. 87
Vital statistics.....	82, 423. 41
Statistics of cities.....	66, 445. 36

Total.....	493, 159. 74
Wealth, debt, and taxation.....	151, 477. 86
Census of manufactures, 1914.....	32, 804. 89
Official Register.....	3, 911. 84
Miscellaneous.....	7, 642. 33
Grand total.....	1, 133, 026. 26

^a Includes cost of supervision for wealth, debt, and taxation.

^b Includes cost of supervision for forest products, cotton, tobacco, electrical industries, and preliminary work on census of 1914.

Title of appropriation.	Appropriation.	Expenditure.
Salaries, Bureau of the Census, 1914.....	\$711,240.00	\$693,245.32
Tabulating machines, Bureau of the Census, 1914.....	12,500.00	20,773.89
Collecting statistics, Bureau of the Census, 1914.....	6 404,000.00	382,707.11
Rent, Bureau of the Census, 1914.....	22,080.00	21,000.00
Purchase of books of reference and periodicals.....	500.00	490.73
Contingent expenses.....	25,000.00	24,809.02
Total.....	1,175,320.00	1,133,026.26

* Includes unexpended balance of appropriation for collecting statistics, Bureau of the Census, 1913, \$50,000, transferred to appropriation for 1914 by urgent deficiency act of October 22, 1913.

Appropriations, Fiscal Year 1915.

The appropriations for 1915 amounted to \$1,537,460. There was a decrease of \$21,280 in the item for salaries, due in part to the discontinuance of one clerical position and the transfer of certain others to the roll of the Department of Commerce, but principally to the discontinuance of a number of subclerical positions and the transfer of others to the roll of the Department as a result of the removal of the Bureau of the Census from its old quarters to the new Department building.

The appropriation for tabulating machines was reduced to \$12,000.

The item for collecting statistics was increased to \$835,000, in order to provide for the quinquennial census of manufactures, to be taken during the calendar year 1915.

The item for rent was discontinued by reason of the removal of the Bureau of the Census to the new Department building.

The appropriation for the purchase of books and periodicals remained unchanged.

The item for contingent expenses was discontinued, such expenses now being paid from the appropriations for the Department of Commerce.

PUBLICATIONS ISSUED.

During the fiscal year the Census Bureau issued the following reports in the form of bound quarto volumes:

Population, 1910:	Date issued.
Vol. I. General Report and Analysis. 1,369 pages.....	Jan. 5, 1914
Vol. II. Reports by States, with Statistics for Counties, Cities, and Other Civil Divisions—Alabama to Montana. 1,160 pages.....	Aug. 23, 1913
Vol. III. Reports by States, with Statistics for Counties, Cities, and Other Civil Divisions—Nebraska to Wyoming; Alaska, Hawaii, and Porto Rico. 1,225 pages.....	Sept. 27, 19

Date issued.

Agriculture, 1910: Vol. V. General Report and Analysis. 927 pages...Nov. 21, 1913
 Manufactures, 1909:

Vol. VIII. General Report and Analysis. 845 pages.....Sept. 15, 1913
 Vol. X. Reports for Principal Industries. 975 pages.....Dec. 30, 1913
 Mining, 1910: Vol. XI. Mines and Quarries. 369 pages.....Dec. 30, 1913
 General Statistics of Cities, 1909. 197 pages.....Sept. 18, 1913
 Financial Statistics of Cities, 1911. 401 pages.....Dec. 8, 1913
 Financial Statistics of Cities, 1912. 410 pages.....June 6, 1914
 Mortality Statistics, 1910. 611 pages.....Oct. 2, 1913
 Mortality Statistics, 1911. 572 pages.....Dec. 17, 1913
 Mortality Statistics, 1912. 382 pages.....Jan. 5, 1914
 Benevolent Institutions, 1910. 411 pages.....Jan. 6, 1914
 Official Register of the United States, 1913. 876 pages.....Jan. 7, 1914

In addition to the foregoing reports, there were issued during the year 84 quarto bulletins and other unbound or paper-bound publications, with a total of 4,298 pages; 7 octavo pamphlets, with a total of 478 pages; 25 preliminary reports, in card form, relating to cotton and cottonseed; 2 semiannual reports, in card form, relating to stocks of leaf tobacco; and approximately 250 press summaries of the Bureau's reports and bulletins, in printed or multigraphed form, varying in length from three-fourths of a column to a column. These summaries were distributed to an average of 1,200 to 1,500 daily newspapers and oftentimes to numerous weeklies as well. They were also sent to State officials, manufacturers, and others interested in the particular industries or subjects covered.

BUREAU OF FISHERIES.

Propagation of Food Fishes.

The fiscal year 1914 was, in general, the most successful in the entire history of fish culture under the Federal Government. This success did not depend on mere numbers of fish produced and distributed, unprecedentedly large though the numbers were, but should be measured also by the fitness for survival and special adaptability for the waters in which an increasingly large percentage of the output was planted. This result has been achieved without any increase in outlay and has depended on augmented efficiency, rigid economy, and development of existing facilities and resources. It is noteworthy that, whereas the cost of fish produced and planted was \$403 per million in 1894 and \$287 per million in 1904, the cost was reduced to \$136 per million in 1914.

The fish-cultural activities of the Bureau were conducted in 34 States, the Territory of Alaska, and the District of Columbia, at 36 permanent hatcheries, and 94 auxiliary and egg-collecting stations.

Upward of 40 of the most valuable food and game fishes of the fresh and salt waters of the country were handled, and the output reached the enormous total of 4,047 millions. Of this number the migratory food fishes of the Atlantic coast streams numbered 485 millions, the commercial fishes of the Great Lakes 1,020 millions, the salmons of the Pacific seaboard 223 millions, the food fishes of the North Atlantic coast (including the lobster) 2,276 millions, and the fishes of the minor interior waters the remaining 43 millions.

Plants of food fishes in rivers, large lakes, and other public waters and in many thousands of small lakes, ponds, and streams were made in every State and Territory. A majority of the plants in minor waters were on farms. The distribution of the output necessitated over 130,000 miles of travel by the special cars of the Bureau and 480,500 miles by detached messengers. All transportation was paid for except about 96,000 miles, which was donated by certain railroads.

So great is the popularity of this work and such the demand for fishes for stocking public and private waters in all parts of the

country that the Bureau is unable to produce certain fishes in sufficient numbers to satisfy the requirements. This is particularly true of fishes adapted for cultivation in ponds. Five new hatcheries already authorized will meet some of the more pressing needs, but additional hatcheries in selected regions are urgently demanded, and such have been recommended to the appropriate committees of Congress. Of the five new stations in question, the two in Kentucky and South Carolina have progressed as far as the available funds permitted, and can not be completed without additional appropriations; work on those in Wyoming and Utah has been delayed by unexpected difficulties encountered in obtaining a clear title to the land, but the construction of the Wyoming station, to be located at Saratoga, will now proceed; no site for the remaining hatchery, in Rhode Island, has yet been selected, but it is the intention to establish a salt-water plant adapted for handling the important economic species of the southern New England and Middle Atlantic coasts.

Several experiments in the acclimatization of aquatic creatures have been continued on a large scale in the expectation that important economic results may be attained. Special mention may be made of the planting of Pacific salmon on the coast of Maine and of Atlantic lobsters on the coast of Washington. During the fiscal year over seven million young humpbacks or pink salmon, hatched from eggs brought from Puget Sound, have been planted in selected streams in Maine, and similar deposits will be made from year to year until the fish is established in its new environment. In November, 1913, over four thousand lobsters, many of them egg-bearing, were transferred with little loss in a refrigerator car from the station at Boothbay Harbor, Me., to Seattle, and thence taken by steamer to the San Juan Islands, where they were deposited in excellent condition at previously selected points.

Frequent embarrassment has arisen in the past from persistent demands for the stocking of certain waters with fish which, in the judgment of officials immediately responsible for the outcome of the work, are unsuitable or undesirable for such waters. These demands are often strongly backed in the best of good will by Senators and Representatives in Congress without full knowledge of the facts or without appreciation of the harm that may result. In order to protect the native fishes from the possible damage that may come from the introduction of inharmonious species, a policy has been adopted, and will be strictly adhered to, under which favor-

able consideration will not be given to applications for fishes for stocking purposes when their known habits and the experience of fish culturists indicate that injury to the native fishes will result. This applies with special force to the planting of predatory spiny-rayed game fishes of the East in the salmon and trout waters of the Pacific States. It may be noted that the stand taken has received the approval of the fishery authorities and commercial organizations in the Western States; and it is hoped that the policy will be upheld by persons interested in or concerned with the preservation of the supplies of native food and game fishes in all parts of the country.

The Fishing Industry.

Through its field inquiries and local fishery offices, the Bureau keeps in close touch with the commercial fisheries. The number of fishery agents is too small, however, to permit a general canvass of all of the fisheries of the country in one season. The plan has therefore been adopted each year of concentrating on some important branches of the industry, obtaining complete statistical and other information regarding them, and issuing to the trade bulletins giving the results of the inquiries. During the fiscal year 1914 such field canvasses were addressed to the menhaden industry, the fresh-water mussel fishery, the pearl-button industry dependent thereon, and the tunny fishery of California.

The menhaden is the most abundant economic species on the east coast of the United States, and supports a very important industry, the fish being used for conversion into oil and fertilizer. The menhaden fishery, which is conducted chiefly with purse seines, has for many years attracted general public attention and local criticism because of the possible injury to food fishes resulting (1) from the withdrawal of enormous quantities of menhaden, on which various important market fishes largely subsist, and (2) from the reported actual capture of such market fishes with the menhaden seines and their utilization at the factories. Accurate data showing the extent and condition of this industry are therefore very desirable, and such were obtained during the first half of the fiscal year for the calendar year 1912, immediately preceding.

The fishery is prosecuted from Maine to Florida, and supplies raw material to 48 factories, a majority of which are in Virginia and North Carolina. Nearly six thousand men were engaged in the industry in 1912, and the capital invested amounted to nearly \$8,000,000. The yield was larger than in any previous year for

which there are statistics, consisting of more than a billion fish, weighing 637 million pounds, valued in the fresh condition at \$2,210,000. About five million pounds of other fish reached the factories; these consisted chiefly of sharks, skates, sea robins, and alewives, the last representing about 90 per cent and coming mostly from Chesapeake Bay. The manufactured products comprised over 88,000 tons of scrap and 6,650,000 gallons of oil, having a value of \$3,690,000.

A canvass of the mussel fishery in streams tributary to the Gulf of Mexico from the Ohio River southward was made during the year, in connection with an inquiry into the pearl-button industry of the entire country. The mussel fishermen in the region named numbered nearly five thousand and took shells which, with the contained pearls, were valued at nearly half a million dollars. These shells were disposed of to factories located in 20 States and were converted into buttons and by-products worth \$8,880,000. It is this important industry, which had its beginning in the United States as late as 1891, that the Bureau is aiding through the operations of the station at Fairport, Iowa, through practical field work on all streams where suitable mussels are found, and through counsel to fishermen, manufacturers, and legislators as to the best means for conserving and utilizing the natural supply of raw materials.

Until very recently no use was made of the abundant supply of tunnies on the coast of California. Within a few years, however, the canning of one species of tunny has been started and already nine canneries have been established in southern California. The annual pack now reaches several hundred thousand cases, and meets with ready sale in all parts of the country. Formerly the entire stock of preserved tunny consumed in the United States was imported from Europe. A special investigation of the fishing and canning methods in California has been undertaken and further studies of the abundance and distribution of the fish which supports the industry are planned. It seems probable that this and related species which are now neglected on other parts of our coast may advantageously be canned or otherwise prepared, and the Bureau is working to this end.

For the great high-sea vessel fisheries centering at Boston and Gloucester the most detailed information has been collated and issued monthly to the trade in the form of one-sheet bulletins. These records, which now cover a long period of years, are invaluable for determining the condition and trend of the most important

offshore fisheries of the country and for showing the relative value of the various grounds resorted to by American vessels.

In the calendar year 1913 these vessels brought into Boston and Gloucester 8,829 fares or trips of fish, aggregating 162,000,000 pounds, valued at \$4,980,000. Compared with the previous year there was an increase of 1,180 trips, a decrease of 20,000,000 pounds of fish landed, and an increase of \$200,000 in the value of the catch. Cod, cusk, haddock, hake, and herring were taken in less quantities, while halibut, pollock, mackerel, and swordfish showed an increase.

The investigation of the New England otter-trawl fishery has been actively pushed, and a report thereon, with recommendations, will shortly be presented to Congress. The field work was brought to a close in December, 1913, and the task of collating and interpreting the mass of information obtained, and of making a critical survey of the trawl fisheries of other countries, was intrusted to a special committee of Bureau officials.

Coastal and High-Sea Investigations.

The study of the biology, physics, and chemistry of the sea, which comprises the science of oceanography, has attained great importance in recent years because of its application to practical fishery problems in all parts of the world but more particularly in the North Sea and other waters on the coast of western Europe. The Bureau of Fisheries, acting independently and in collaboration with the International Council for the Exploration of the Sea, has recently improved its equipment for oceanographic work, and is systematizing its methods and laying plans along lines which will be likely to yield the best and most immediate results. While much of this work appears to have only a superficial or remote bearing on practical questions, as a matter of fact it affords data which are indispensable for a proper interpretation of the phenomena presented by the economic creatures of the coastal and offshore waters, and for a comprehensive administration of the sea fisheries.

In the summer of 1913 the auxiliary schooner *Grampus* was engaged in investigations extending from the Gulf of Maine to the Capes of the Chesapeake; and in the spring of 1914 the Bureau cooperated with the Coast and Geodetic Survey in an expedition of the steamer *Bache* from the Capes of the Chesapeake to Bermuda and thence to the coast of Florida, the Gulf Stream being covered

by a number of lines of investigation as far south as Key West and Habana. A large amount of valuable data and specimens was collected, and it is evident that this work will yield much new information regarding ocean currents, salinities, and temperatures, all of which have an important influence on the distribution of fishes and the site of fishing operations. In addition, there has been a decided increase in knowledge of the spawning grounds, early life, and food of certain fishes.

Pursuant to an agreement reached at the International Maritime Conference in London, the Department called on the Bureau in the spring of 1914 to participate in the ice patrol of the trans-Atlantic steamship lanes, by placing an oceanographic observer on the revenue cutter *Seneca*, which had been assigned to this work. It is believed that investigations of this character will throw much light on the source and movements of icebergs under the influence of currents; and it is possible that the floating animals and plants, which constitute the "plankton" and which can be traced to their source wherever found, will afford better criteria than the physical phenomena, which are obscured by the blending and interference of the various oceanic currents. Inasmuch as most of this work is done on or near the Grand Banks of Newfoundland, it yields information that is valuable to the fisheries as well as to navigation.

While engaged in oceanographic investigations, the *Grampus* discovered the presence of beds of the giant or smooth scallop in deep water off the coasts of the southern New England and Middle Atlantic States. Later the vessel was detailed to make a more thorough examination, which disclosed the existence of an abundant and hitherto unsuspected supply of this valuable shellfish, which always meets with ready sale. One of the most productive of the beds reaches within 40 miles of Sandy Hook; and as it covers a large area and is readily accessible, it is believed that a lucrative fishery may be developed. An illustrated circular, describing the scallop grounds and calling attention to the possibilities, was issued immediately.

A number of years ago the Bureau demonstrated the abundance of sea bass or blackfish on a fishing bank lying off Beaufort, N. C. The information was not brought prominently to the attention of the local fishermen, and the existence of this fishing ground was disregarded. In 1913, however, as a part of the increased activity at the Beaufort fisheries station, certain of the more enterprising local fishermen were induced to test this bank, with results so

promising that the *Fish Hawk* was detailed for further investigations. A number of adjacent banks were found, and a circular was issued giving information as to their location and productiveness. The outcome has been the establishment of a remunerative and growing sea-bass fishery. Arrangements have been made for placing a permanent buoy on the principal bank to aid the fishermen in finding the best grounds, and a further survey will be made in the hope of locating new grounds.

During the winter and spring of 1914 the *Fish Hawk* conducted biological and physical investigations in Chesapeake Bay in connection with a study of the habits and distribution of the fishes of that region. This work will have to be continued over a series of years, but already certain significant information has been obtained which may explain the heavy winter death rate among young food fishes and reasons for the irregularities in the runs of various migratory species.

In response to requests from fishermen and other persons on the coast of Oregon and Washington, the Bureau, in the spring of 1914, began an investigation to determine whether the supply of halibut and other fish on certain grounds lying a considerable distance offshore was sufficiently abundant and regular to warrant the fishermen in equipping themselves for a large fishery. The steamer *Albatross*, with her regular personnel supplemented by a crew of experienced halibut fishermen, was employed for this purpose, and the work had not been completed at the close of the fiscal year. Valuable information, some of it of a negative character, has been obtained, but the investigation has not progressed sufficiently far to warrant a definite statement as to the possibilities of the grounds in question.

Various other marine-fishery studies have been undertaken and were in progress at the close of the fiscal year. Among these was an investigation of the shrimp of the Gulf and South Atlantic coasts for the purpose of determining what regulative legislation and other kinds of conservation are necessary in order that the supply of this valuable crustacean may be preserved.

Surveys and Investigations of Lakes and Streams.

There has been the usual field work addressed to fresh waters in all parts of the country. These investigations in some cases have been precedent to fish culture or the systematic stocking of waters with desirable food and game fishes, and in others have been related to fishing operations.

In cooperation with the Wisconsin Geological and Natural History Survey, the Bureau has continued the investigation of the interior lakes of the State in an effort to establish the fundamental biological and physical conditions of lake life. The work is being conducted in great detail and will establish a basis for the better understanding of lake phenomena in other regions. In Lake Champlain a biological and fishery investigation has been commenced in cooperation with the Vermont Fish Commission, the primary object being the feasibility of conducting commercial fishing operations for certain food fishes without detriment to the sporting interests, which are a valuable asset to the people of Vermont and New York.

The construction of the great dam at Keokuk, Iowa, has produced a long, narrow body of water known as Lake Cooper, which bears a close resemblance to Lake Pepin, a natural expansion of the Mississippi River in Wisconsin and Minnesota. The fisheries of Lake Pepin are the most important in the entire river, and it is probable that Lake Cooper, under proper treatment, may be made to serve a very useful purpose supplemental to and in no way interfering with its primary use for the generation of electric power. With this in view, the lake has been placed under observation, and there have been begun studies of the minor life on which fishes and other economic forms ultimately subsist, in the expectation that the conditions may be found suitable for the planting of fishes and mussels. Coincidentally there has been made an investigation of the effects of the dam, turbines, and locks on the movements of migratory fishes.

In continuation of the systematic survey of the mussel resources of the Mississippi Basin, the upper Missouri River drainage system and the Ohio River Valley have been brought under investigation. The special publications covering the results of this work have been very favorably received by the pearl-mussel interests, and in some cases have opened up new fields for industrial enterprise. These studies have afforded data on which to base recommendations for protection of the mussel fisheries, and the steps necessary for the conservation of the mussel resources have been embodied in a report which has been brought to the attention of all the States interested.

The salmons of the Pacific streams have continued to receive attention, and a new and systematic inquiry into the life history of the species inhabiting the Columbia and Sacramento Rivers

has been begun. This will involve mainly the study of the habits, a very valuable new means of determining important facts in the lives of fishes.

Operations at the Fisheries Laboratories.

The marine laboratories at Woods Hole, Mass., and Beaufort, N. C., and the fresh-water laboratory on the Mississippi River at Fairport, Iowa, have been actively utilized for investigations, researches, and experiments of either immediate or prospective value to the fishing industries.

At Woods Hole, in addition to the usual studies of the habits, food, abundance, and parasitic affections of fishes, investigations of the dogfish and the sea mussel were conducted during the summer of 1913 as a part of the campaign for the commercial utilization of these waste products. Among the various other matters under consideration was the cause of "green gill" in oysters—an affection which, while entirely harmless, causes large losses to oyster growers because of popular prejudice. Other studies of the oyster were addressed to the life histories of some common oyster enemies, with a view to the discovery of a stage or habit through which they may prove vulnerable to measures for their destruction. There is a growing public demand for definite information regarding the effects on fishes of various water pollutions, and laboratory tests were made as to the toxicity of various mineral substances likely to be discharged into streams. Closely connected with this subject was a research into the oxygen requirements of fishes, especially in relation to the discharge of sewage and other decaying organic matter which, by its oxidation, reduces or entirely consumes the oxygen supply available for fishes.

At Beaufort steps have been taken looking to the utilization of the laboratory for practical fish hatchling at a time when the other activities are reduced, and useful information has been obtained regarding the spawning of a number of important fishes whose cultivation seems desirable.

Owing to the growing demand on the supply of edible crabs in the Beaufort region and elsewhere along the east coast and the apparent depletion of some of the most productive grounds, studies and experiments have been begun for the purpose of determining the necessary conservation measures that will least disturb the fishery.

There has been a continuation of the tests, that have been in progress for several seasons, to determine the practicality of protecting piling and other wood from attacks of marine borers by the use of impregnating solutions of metallic salts and other substances.

Progress has been made in the culture of the diamond-back terrapin at Beaufort, where the feasibility of breeding and rearing under artificial conditions has been amply demonstrated. The recent experiments have been directed to improvements in the methods of feeding and selective breeding with a view to the development of a superior race. The practical results already attained have been such as to lead to the establishment of a near-by terrapin farm, under private auspices, and the outcome confirms the view that terrapin culture is commercially profitable.

Limitations imposed by law as to the manner of acquiring the site for the fisheries laboratory authorized to be located on the Gulf coast of Florida have delayed the establishment of that station. A desirable tract of land near Key West having been donated and this region having been found to afford superior facilities, Congress was asked to amend the law so as to sanction the acceptance of the property directly from the owners. An item to this end was inserted in the act making appropriations for the Bureau which became a law in August, 1914.

The newly established Fairport station, which is one of the best-equipped institutions of the kind in the world, has been made ready for the important practical work for which it was established, and supplies a deficiency which has retarded the proper development of the fisheries of the Mississippi Valley. The laboratory admirably combines facilities for research and experiment with practical equipment for extensive operations in mussel and fish culture, and has already justified the wisdom of Congress in providing a station whose utility was quite uncertain. In addition to practical mussel culture on a large scale, the laboratory activities have included the determining of the conditions under which three important species of mussels may be propagated; material progress in rearing young mussels and in fixing the rate of growth of both young and old; experiments looking to the utilization of mussel meats, of which a very large quantity is now wasted; researches into the conditions controlling the production of lustrous and therefore valuable shells; and various other lines of progressive work which is necessary to a full utilization of the mussel resources of the country and has . . . the field of mussel culture.

The propagation of pearly mussels has already assumed noteworthy proportions. In the fiscal year 1914, the second season of its active prosecution, over 277 million larval mussels were planted in the Mississippi River and its tributaries in Iowa, Minnesota, Wisconsin, Indiana, and Arkansas. To carry this number of young mussels, more than 107,000 fishes were infected and then liberated in the streams. Over 60,000 of these fishes were rescued from overflowed lands, where they would otherwise have perished; and as all of them were of breeding age and mostly of valuable species, this incidental feature of the mussel work would in itself largely justify the expenditures incurred. During the several weeks when the larval mussels are carried as parasites in the gills and on the fins of fishes, the latter roam widely and doubtless give the young mussels a very general distribution throughout the entire Mississippi Basin. The experience now being gained at the laboratory will permit a vast extension of this work at diminishing unit cost, and the results will in due time be unmistakable.

Protection of Alaska Fisheries.

The welfare of the vast fishing industry in the coastal waters and streams of Alaska depends largely on the existence of proper protective laws and on their adequate enforcement. New legislation is demanded in order to meet new conditions, and a general revision of the laws under which the Bureau is now operating would be desirable. Under rational laws that will recognize the fundamental requirements of the aquatic creatures and not unduly restrict the industry, and with the large discretionary powers now vested in the Secretary of Commerce, it is felt that the fishery resources of Alaska will remain unimpaired for an indefinite period. Furthermore, in view of the large Federal expenditures on behalf of the fisheries of Alaska, provision should be made for increased revenue therefrom; this can be secured without the imposition of any burdensome tax on any branch of the industry.

During the year the fishery laws and the regulations made thereunder have been enforced to the full extent of the facilities provided by Congress, and supplemental aid in this work has been rendered by fur wardens and by employees of the fish cultural force temporarily detailed for the purpose. It is not claimed that the service has been satisfactorily performed, but much as a material increase in personnel is necessary for the proper patrol of the long coast line, the agents have been active

and zealous, and it has even been possible to extend the inspections along certain lines.

During the season of 1913 the Bureau was for the first time provided with a vessel of its own with which to make some inspections and patrol a portion of the coastal waters. This vessel, the *Osprey*, a second-hand steamer 72 feet long, was put into commission in July, 1913, and has since been in continuous service in southeast Alaska. In the period of most active salmon fishing the operations of this vessel were supplemented by a number of chartered power boats and by the use of a launch attached to the Yes Bay hatchery. This is the only part of Alaska in which any approximation to an adequate enforcement of laws was possible; and additional vessel and boat facilities are most urgently demanded. It is gratifying to note that these have in part been provided in the act making appropriations for the fiscal year 1915.

The large business interests which are at stake and the vast supplies of food and other products which are involved in the perpetuation of the Alaskan fisheries are well known to many persons but are not fully realized by the general public. The weighty responsibility of administering the fisheries in a proper manner is appreciated by the Bureau, and the granting of suitable personnel and facilities is an urgent duty now incumbent on Congress.

In 1913 the fishing industry of Alaska gave employment to more than 21,700 persons, including over 4,000 natives. The investment in fishing property exceeded \$37,000,000, of which \$34,953,000 represented the salmon industry. The products were valued at about \$15,740,000. The catch of salmon aggregated 59,915,000 fish, from which there were prepared 3,739,000 cases of canned fish valued at \$13,531,000 and miscellaneous products valued at \$917,600. Fewer canneries were in operation than in 1912, and there was a decrease in the salmon yield and in the canned output. In southeast Alaska the run of red salmon was unusually light, but the supply of humpback and dog salmon was large. The general run in central Alaska was below normal, and humpbacks were scarce, while the early fishery for king salmon in Cook Inlet was good. In western Alaska, with fisheries located principally in the Bristol Bay region, there was the best known run of red salmon.

The census of spawning red salmon ascending Wood River was continued in 1913, and showed an increase in the run amounting to 100 per cent as compared with 1912. The figures, while indi-

cating less than one-third the supply that was present in 1908, are not conclusive and should be supplemented by data for other years. It is much to be regretted that this important and unique work, involving the actual enumeration of the entire run of salmon to the spawning grounds of a large stream, had to be abandoned in 1914, owing to the delay in the passage of the appropriations.

The five private salmon hatcheries in operation in 1913 liberated 77,997,000 red salmon fry, and earned for their owners tax exemptions on canned salmon amounting to \$31,197. The two Federal hatcheries produced 50,488,000 red-salmon fry and 16,834,000 humpback fry, and in addition supplied 2,000,000 red-salmon eggs to the Oregon Fish Commission.

Fur-Seal Service.

The important duties and responsibilities of the Department on and in connection with the Pribilof Islands received special attention throughout the year. The annual shipment of supplies required for the support of the native inhabitants of the islands and for the maintenance of Government property were delivered by a chartered vessel in the early part of the fiscal year. The medical and sanitary needs of the natives, which are constant and increasing, have been met as far as the resources of the Department permitted; and schools for the native children have been maintained under efficient teachers.

In the spring of 1914, when the shipment of the usual supplies for the seal islands was under consideration, it was decided to make the purchases in Seattle, instead of San Francisco, as heretofore. The Department, however, is not committed to any particular market, and will hereafter procure supplies wherever the conditions are most advantageous as regards prices and shipping facilities.

The wireless telegraph station established and maintained by the Navy Department on St. Paul Island was in operation throughout the year, and is indispensable as providing the only means of communication during about two-thirds of the year. The Navy Department has also a small wireless station on St. George Island, enabling that island to communicate with St. Paul. Increased economy and efficiency in administration are secured through this arrangement, and the depressing isolation to which the Department's officials are subjected is considerably relieved. During a large part of the year the wireless station on St. George Island was

in charge of the school-teacher assigned to the island, this service being voluntarily assumed in addition to his regular duties.

The land killing of seals being restricted by law to the immediate requirements of the native inhabitants of the islands, the number of young male seals authorized to be taken during the season of 1913 was tentatively fixed at 3,000; later, in the fall and winter of 1913, permission to take additional seals for native food was given. This limit was not reached, but the needs of the natives appear to have been practically subserved; the agent on St. Paul reported the supply of seal meat to have been ample, while the agent on St. George Island advised that more meat could have been used in fall and winter had the seals been available at that time.

The annual shipment of sealskins was made in August, 1913, on the chartered vessel that carried supplies to the islands. Up to that year the sales of Alaska skins had always been made in London. The Department, however, felt that economic and other considerations justified the attempt to establish an American market for this strictly American product which is largely used by the American public. It was therefore decided to initiate the selling of the Government's fur-seal skins in this country, and satisfactory arrangements to this end were made with the firm of Funsten Bros. & Co., of St. Louis. The available skins numbered 2,296, of which 1,896 were sold at public auction in St. Louis on December 16, 1913. The remaining 400 skins were withdrawn from sale at the request of the chairman of the Committee on Expenditures in the Department of Commerce, House of Representatives, and these skins were unsold at the close of the fiscal year. The gross proceeds of the sale were \$54,579, an average price of \$28.786 per skin; the net proceeds were about \$50,950. Taking into consideration the extremely unsettled condition of the general fur trade of the world and the rather poor quality of the skins as a whole, the outcome was regarded as satisfactory. The sale was attended by many buyers from Europe and America and attracted much attention.

It is a pleasure to refer to the efficient patrol of the North Pacific Ocean and Bering Sea maintained by vessels of the Revenue-Cutter Service throughout the season when pelagic sealing operations are possible. These vessels incidentally render an invaluable service to the Department by transferring officials and mail to and from the seal islands, and by transporting limited quantities of supplies.

The fur-seal question has continued to be a subject of public discussion, but the Department is not involved therein, except in so far as it has been criticized for the rigid enforcement of the law and for the exercise of its discretionary power over the killing of seals for the use of the natives in accordance with the evident spirit of the law. No question whatever relative to the merits or demerits of the existing close-time law has been presented to the Department by either Congress or the President, and no action in regard to the abrogation or modification of that law has been incumbent on the Department up to this time. In the very short period that has elapsed since the law went into operation and its effects could be gauged, the full duty of the Department seems to have been performed by ascertaining and publishing the facts as to the recuperation of the herd.

In the latter half of the fiscal year, and two years after the suspension of pelagic sealing, the Department determined to undertake an exhaustive inquiry, under competent jurisdiction, regarding the condition of the herd, the effects thereon of the sealing convention and the law of August 24, 1912, giving effect thereto, the operation of the close-time feature of that law, and the entire subject of the relations and the responsibility of the Government toward the seals, foxes, and other animals of the Pribilofs as well as toward the native inhabitants of the islands.

The primary object of this inquiry was to provide the Department with data on which could be based such representations to Congress as the facts demanded. It was obviously the proper course of procedure to employ for this purpose persons who were not involved in the seal controversy that has been waged with little intermission since 1890. The desire of the Department to obtain information through new agencies implied no criticism of previous instruments but rather a belief, based on assurances from various sources, that a new viewpoint would be welcomed by everyone concerned and would be approved by all persons interested in seeing the facts established.

Accordingly, on the recommendation of the Commissioner of Fisheries, arrangements were made for the nomination of three specialists not connected with the Department, not previously concerned with the fur seals, and selected by outside agencies for the particular inquiries in hand. In compliance with my request to the Secretary of Agriculture that he designate a duly qualified person versed in the breeding and other habits of wild and domestic

animals to serve as a special assistant of the Department, Mr. Edward A. Preble, of the Bureau of Biological Survey, was named. The Secretary of the Smithsonian Institution was asked to make a similar nomination, and selected Mr. Wilfred H. Osgood, of the Field Museum of Natural History, Chicago. For a nomination of a third person, the President of the United States invoked the National Academy of Sciences, which submitted the name of Prof. George H. Parker, of Harvard University. These gentlemen were duly appointed special assistants of the Department, were given individual and joint instructions, and were sent to the seal islands on a revenue cutter sailing from Seattle early in June, 1914. It was planned to have these specialists remain on the grounds until the latter part of August, so that they might become personally familiar with the fur seals during all critical stages of their land life.

Shortly before the departure of these assistants the Department was advised that the British and Japanese Governments desired to send experts to the seal islands to observe the condition of the herd, and steps were at once taken to provide transportation and other facilities. The two representatives of Great Britain were cared for on the vessel that carried the American agents, and the Japanese expert, arriving in Seattle early in July, was taken to Unalaska in a regular passenger steamer, and transferred thence to the seal islands in a revenue cutter.

Detailed reports are expected from the Department's agents at an early date. Meanwhile, it may be stated that they found the seal herd in excellent condition, having undergone a noteworthy increase since 1913. It was on the recommendation of these agents after they had studied the situation that the take of seals for the use of the natives was fixed at 4,500 for the season.

In the summer of 1914 the Department was apprised of the existence on the seal islands of social conditions highly prejudicial to the interests of the Government and natives. An investigation was at once ordered, and steps were immediately taken to correct the abuses, which are largely the result of administrative laxity of long standing.

Minor Fur-Bearing Animals of Alaska.

In the winter of 1912-13 the Government herds of blue foxes on the seal islands yielded 436 pelts, which were shipped to St. Louis and sold at public auction on the occasion of the fur-seal sale. The gross amount received ~~at that time~~ was \$17,552.

At the beginning of the year the Department was informed by the Commissioner of the Bureau of Fisheries that the fur-bearing animals in Alaska were scarce and that the Department should consider the possibility of issuing permits for the taking of such animals. The Department was at first inclined to refuse such a request, but after a careful study of the matter it was decided to issue permits for the taking of fur-bearing animals in Alaska for the purpose of breeding and for the purpose of taking for the fur trade. A permit is required for the taking of such animals for the purpose of breeding and for the purpose of taking for the fur trade.

The permit requirement was first issued in 1912 for the purpose of breeding fur-bearing animals in Alaska. It was then revised in 1913 and 1914. It is now required in the case of those who wish to take fur-bearing animals from Alaska for the purpose of breeding and for the purpose of taking for the fur trade. Careful consideration was given the matter and it was decided that the proper development of the fur industry in Alaska demanded some modification of the close-time regulations. Accordingly, in the revised regulations issued under date of June 25, 1914 (Department Circular No. 240, second edition), provision was made for the taking of foxes, marten, mink, and land otter for breeding purposes during a part of the prescribed close time. In order that the Department may keep thoroughly informed regarding this new phase of the fur industry and prevent the abuse of the privilege of taking animals at a time when killing is prohibited, it is now required that all persons engaged in the business of taking fur-bearing animals in Alaska shall first obtain a license, furthermore, a permit is required before such licensed fur farmers may ship their stock outside of Alaska.

Many permits affecting fur-bearing animals have been issued by the Department during the year, among them 31 permits to 16 persons and firms authorizing the shipment of 910 ranch bred foxes.

The injurious effects of the eruption of Katmai on the animal life of the Afognak Reservation are well known. In view of the growing scarcity of foxes and land otters therein, it was deemed necessary to establish an absolute close time for a series of years. Accordingly, under date of October 29, 1913 (Department Circular No. 252), it was ordered that the pursuit, capture, or killing of foxes within the reservation should be prohibited until November 16, 1918, and of land otters until November 16, 1915.

Under the authority of law, the Department has ordered to issue for fox-breeding purposes, for periods of five years, 12 permits.

lying off the Alaskan coast. In response to a circular announcement issued in 1913, bids for two islands, at \$205 and \$200 per annum, were received and accepted. A second announcement, dated January 1, 1914, inviting proposals for leasing the remaining 10 islands, resulted in bids for 3 islands at \$200, \$205, and \$250 per annum, which will probably be approved. The offer of the Department to supply blue foxes for breeding purposes from the herds on the Pribilof Islands evoked a number of competitive bids, the highest being \$151 apiece for selected animals. Some deliveries have been made, but the plan presents a number of difficulties connected with the shipment and care of the foxes.

The present general law for the protection of fur-bearing animals in Alaska has proved quite inadequate in some respects. One serious defect is that its prohibitions apply only to the actual killing of animals, leaving the Department powerless to check operations of various kinds quite as detrimental as killing would be. The Department should have full and broad authority for regulating the capture of fur-bearing animals, so as to make hunting and trapping out of season illegal, to prevent the unlicensed destruction of burrows and the taking of young under circumstances that inevitably result in large mortality, and to permit the Government to adopt such other procedures as are generally recognized as necessary for the proper protection and conservation of the valuable fur resources of the Territory.

Custody over the terrestrial fur-bearing animals of Alaska, which is now imposed by law on the Bureau of Fisheries, is an uncongenial, incongruous duty entirely foreign to the proper functions of that Bureau. The legitimate activities of the Bureau require the undivided attention of the staff, and I therefore sympathize with the attitude of the Commissioner of Fisheries toward this matter and approve his recommendation for the transfer of this service to some other Government agency, preferably the Bureau of Biological Survey of the Department of Agriculture, which already has jurisdiction over certain of the animals of Alaska and is fully organized for administering all matters connected with the fur-bearing animals at large. The Department should continue to exercise control over all the fur-bearers whose pursuit constitutes a fishery; and, in addition thereto, it should have authority over the walrus, which at present comes under the jurisdiction of the Department of Agriculture.

Meanwhile, however, the Department is endeavoring to promote the fur industry of Alaska in every feasible way; and it favors the speedy enactment of legislation that will correct defects in existing law and will exemplify the Department's policy for the preservation of the wild stock (which must for a long time constitute an important means of livelihood to many people in Alaska) and for the building up of an additional fur industry through the domestication and cultivation of fur-bearing animals under private auspices.

Miscellaneous Matters.

The Aleutian Islands Reservation.—Under the Executive order of March 3, 1913, creating the Aleutian Islands Reservation, the Secretary of Agriculture and the Secretary of Commerce have issued joint regulations for the administration of the reservation, effective March 15, 1914. Under these regulations "all matters pertaining specifically to the fisheries and all aquatic life, and to the killing of fur-bearing animals, will be under the immediate jurisdiction of the Department of Commerce," while various other matters come under the joint jurisdiction of the two Departments.

Fishery matters in Congress.—Fishery legislation of unusual importance was considered at the second session of the Sixty-third Congress, and the Department was called on for reports on numerous measures and testimony before committees of the Senate and House.

A bill which marked a wide departure in Federal fishery legislation provided for national control over migratory fishes which do not pass their entire life within the jurisdiction of a given State. Extended hearings on the measure were given by the House Committee on the Merchant Marine and Fisheries, but no further action has yet been taken.

No legislation has as yet been enacted to give effect to the treaty of April 13, 1908, providing for joint international regulations governing the fisheries in the contiguous waters of the United States and Canada. As long ago as 1910, the Canadian Government adopted the regulations made under the treaty, but opposition developed in Congress, and the entire matter had lain dormant in the United States since 1911. In 1913 a new international fisheries commissioner on behalf of the United States was appointed, and the matter was reopened with a view to securing some action by Congress which would permit the Federal Government to en-

fishery.

Trout are

scarce

on the coast

but are

found in great numbers

in the interior

and in 1900 the catch

was 100,000 fish.

They are sold for

export to the States and

also for home consumption.

Salmon are also

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force a system of protection for the food and game fishes in the waters of our northern boundary. The Senate passed the necessary bill in March, 1914, and the Committee on Foreign Affairs of the House, after a number of hearings, made a favorable report, but final action has been delayed.

In the act making appropriations for the fiscal year 1915, the following limitation is placed on the sum provided for the propagation of food fishes:

No part of the foregoing amount shall be expended for hatching or planting fish or eggs in any State in which, in the judgment of the Secretary of Commerce, there are not adequate laws for the protection of the fishes, nor in any State in which the United States Commissioner of Fisheries and his duly authorized agents are not accorded full and free right to conduct fish-cultural operations, and all fishing and other operations necessary therefor, in such manner and at such times as is considered necessary and proper by the said commissioner or his agents.

This important legislation, which is heartily approved by the Department, will necessarily conduce to increased efficiency of the fish-cultural operations and should lead to much needed cooperative efforts on the part of the States.

Cooperation with other departments.—In connection with investigations carried on by the *Fish Hawk* in Chesapeake Bay and tributaries in the winter and spring of 1913-14, facilities were furnished to the Department of Agriculture for making a sanitary examination of the oyster beds.

Arrangements have been made with the Department of the Interior and the Department of Agriculture whereby the Bureau will hereafter systematically supply desirable fishes for stocking the waters of national parks and forestry reservations. The work will be conducted on a large scale and will cover a definite period of years, in the expectation that the attractiveness of the parks and reservations to the general public may be increased by the fishing facilities.

A large number of samples of foreign and domestic fishery products have been submitted to the Bureau by the Bureau of Chemistry of the Department of Agriculture. These have been examined and identified, and reports thereon prepared with reference to the application of the food and drugs act.

Pacific coast branch.—In order to maintain more intimate relations with the important fishery interests on the Pacific coast with which the Bureau has to deal, a branch office was established in Seattle near the close of the fiscal year. This will be the headquarters for the fishery, fish-cultural, and other branches of the work; and should result in increased efficiency and economy,

more particularly in the matter of the purchase of supplies for the Alaska service and for the numerous hatching stations in the Northwest. It is proposed to place the office in charge of an experienced assistant, and to make it a center for the collection and dissemination of information regarding all fishery matters pertinent to or of practical interest to the Pacific States and Alaska.

Maine lobster conference.—In view of the importance of the lobster industry of Maine and the activities of the Bureau in relation thereto, a conference was held in January, 1914, at the office of the Commissioner of Fisheries for the purpose of announcing the attitude of the Department toward certain features of the work and of learning the views of the State fish commissioner, lobster fishermen, and lobster dealers, all of whom were represented at the conference. The governor of Maine and the State delegation in Congress were also present. The proposed new policy of the Department, under which the expenditures for lobster culture will be more direct and effective, was unanimously approved.

Pollution of waters.—The Bureau is not provided with the necessary means of performing its duties with respect to the pollution of lakes and streams. It has, however, made what effort it could, and in cooperation with the Illinois Natural History Survey contributed to the study of the discharge from the Chicago Drainage Canal. This investigation, the results of which were published by the State of Illinois during the past year, yielded data of great importance and of application to other streams carrying large quantities of domestic and municipal sewage.

Complaints that oil refineries and tank steamers were polluting the Delaware River to the detriment of the fisheries were investigated, and some ill effects were apparently to be found, but the season was not advantageous for accurate determination. The presence of the oil was thought to affect the salability of the fish rather than their movements and distribution.

The discharges from the Government powder factory at Indian-head, Md., upon investigation were found to be toxic, and the Secretary of the Navy, upon request, took measures to remedy conditions complained of, although no positive injury to fish was disclosed.

Utilization of neglected aquatic products.—Continuing its efforts to establish a market for certain very wholesome but now unutilized products, the Bureau has conducted a special publicity

campaign in behalf of the sea mussel. Through the press and otherwise, it was possible within a few months to establish this new sea food upon the menus of over 70 hotels, restaurants, and clubs of Boston, and retail dealers were induced to offer mussels for sale under placards bearing the Bureau's indorsement. There was also issued and widely distributed by the Bureau a circular, describing sea mussels, explaining their excellence and cheapness, and giving a number of tested recipes for cooking them. This propaganda was so successful in various Massachusetts cities and towns that the campaign will be extended to other parts of the country. Canned mussels are a highly satisfactory product available to the inland public.

Efforts to create a market for the dogfish have been of slow progress because of the prejudice against the fish, and success will apparently depend upon securing legislation enlarging the Bureau's authority.

Fish culture on the farm.—The Bureau believes that in sections of our country an acre of water can be made as productive of food values for the farmer as an acre of land. With this in view it is encouraging farmers to use small ponds that may exist upon their land or to create such ponds. The Bureau will stock them with food fishes suitable for the locality, providing these without expense and instructing the farmer in their care. In this way an additional food supply is being provided in many portions of the country.

Alaska inspection.—In the spring of 1914 Dr. E. Lester Jones, Deputy Commissioner of Fisheries, was instructed to proceed to Alaska and make an inspection in that great territory of the conditions affecting the work of the Bureau. From this trip he has but just returned and his report had not been received when this was written. It is known, however, that a mass of information has been collected and many photographs have been taken which will throw a flood of light upon Alaskan conditions.

Dr. Jones was fortunately near at hand when conditions arose upon the Pribilof Islands requiring immediate investigation. He took charge of that inquiry and conducted it with care and promptness to a satisfactory conclusion, which has resulted in marked improvement in official and social relations upon the islands. The Department, however, believes that it is essential for the security of the Government property and the maintenance of order and law upon the islands that there should be an officer of

more authority than has heretofore been available. A request will therefore be made to Congress for authority and an appropriation for a superintendent of the islands who can be directly responsible for all the conditions there. In view of the fact that there is Government property to the potential value of many millions on these islands, together with a community of some hundreds of souls, the necessity for such an officer would seem justified by theory, and experience has also shown that the need exists.

Urgent need for fish pathologist.—The Department has repeatedly requested from Congress authority to appoint a fish pathologist on the staff of the Bureau, and this request, though approved by the Senate, has always been rejected by the House of Representatives. It is difficult to understand why this should be refused. The Government does not hesitate to provide inspectors for meat, and the States provide for inspection of milk. Evidence has been placed before Congress indicating that diseased fishes may cause disease in human beings, and that in some cases there is a common cause of disease in human beings and fishes; and evidence is available showing also that diseases in human beings are transmitted through water to fishes, making them unfit for food. Yet an appropriation of \$2,500 to give this subject scientific thought is continuously denied. If this be on the ground of economy, it can only be justified on the theory that dollars are worth more than lives, which I imagine the people would hardly approve should the facts be brought home to them.

The Department takes this occasion to say that a pathologist for studying the diseases of fishes is an urgent necessity in the interest of the fish-cultural work and of the public, and that since the Department is not permitted to make this inquiry it must not be held accountable for large avoidable losses of valuable fish or for diseases that occur through unknown causes arising from fish life.

BUREAU OF LIGHTHOUSES.

The reorganization of the Lighthouse Service under the provisions of the act of Congress approved June 17, 1910, was entirely completed during the early part of the fiscal year 1913, and continued to operate satisfactorily during the fiscal year 1914. All of the lighthouse districts, with the exception of the three river districts, are now in charge of civilian inspectors. It is believed that the efficiency of the Service has been increased by the reorganization and that the work is more economically performed, especial attention being invited to the fact that up to July 1, 1914, there has been an increase of 2,485, or more than 21 per cent, in the number of aids maintained over the corresponding number on July 1, 1910, while the total general appropriations for the support of the Service for the fiscal year 1915 are about \$320,000 less than those for the fiscal year 1911.

The general organization of the Lighthouse Service remains the same as described in the annual report for 1913.

On June 30, 1914, there were 5,562 persons employed in the Lighthouse Service, including 93 in the technical force, 143 in the clerical and office force, and 5,326 connected with depots, light-houses, and vessels.

Administrative Methods and Economies.

A conference of lighthouse inspectors, authorized by me, was held for the first time in the history of the Service during February, 1914. A detailed synopsis of subjects for discussion, under the general heads of aids to navigation, administrative methods, construction work, apparatus and equipment, vessels, and similar topics was prepared and distributed in advance. The proceedings were entirely informal, and general minutes embodying the results of the discussion were subsequently sent to the various inspectors. A visit to the general depot closed the conference. The results are believed to be of great value in effecting a closer degree of cooperation and efficiency, as well as affording inspectors an opportunity for interchange of ideas and methods.

Systematic inspections were continued during the fiscal year in the various lighthouse districts by the general inspector, examiner,

and officers of the Bureau. The increasing value of this work in maintaining the Service at a high standard is shown in the results accomplished.

Revised instructions relative to making requisitions for office furniture, equipment, and supplies, in conformity with a revised manual issued by the Department on the subject, were issued during the year.

A general examination was made of library books furnished isolated stations and vessels, and instructions were issued for general improvement of them, including books for children where desirable.

An inquiry was made in reference to educational conditions for children of lighthouse keepers at such stations as are not readily accessible to ordinary school facilities, and arrangements made for systematic transfer of such keepers and consultation with local educational authorities when practicable.

A standard method of handling requests of lighthouse keepers for transfers was outlined, in order to insure equitable treatment of such employees and uniformity in the matter.

Permission was obtained from the Civil Service Commission for transferring keepers or employees from trades or mechanical positions to that of watchman in the Lighthouse Service under suitable restrictions as to eligibility.

New regulations governing the payment of medical and surgical, also of burial, expenses for nonstatutory employees were put into effect during the fiscal year. These provide for a maximum payment of \$100 for each object, under proper safeguards and restrictions.

Commutation of subsistence on lighthouse vessels, authorized by the act of August 24, 1912, and inaugurated last year, was gradually extended during the fiscal year, and at the close thereof all lighthouse vessels, including light vessels and tenders, were operated under this system with excellent results. In order to provide against any possible shortage in food supplies, reserve provisions consisting of meat and pilot bread in tins were prescribed for isolated vessels and stations in quantities suitable for the various complements and localities, and instructions issued for the proper consumption of such provisions in rotation; also for their replenishment and inspection at stated intervals.

Revised instructions governing the sale of condemned property, in accordance with the act of March 4, 1913, were issued. These

provide for sales under sealed bids, where desirable, and for more prompt forwarding of the gross receipts and for the payment of expenses of the sale from such receipts by the disbursing clerk of the Department.

Tentative arrangements were made for the exhibit of the Lighthouse Service at the Panama-Pacific International Exposition, to be held in San Francisco in 1915. Estimates of expense and lists of articles to be exhibited were prepared, and an allotment of \$4,750 was granted by the governing board from the appropriation made for the Government's exhibit. An examination of records was made to ascertain the nature and number of lighthouse articles of historical interest which might be of value to the exhibit.

The order of the Postmaster General increasing the limits of weight for mail matter transmitted by parcel post within certain zones to a maximum of 50 pounds was put into effect in the Lighthouse Service and has proven advantageous in shipping many small articles of supply.

With a view to avoiding any delay in the business of the Service, a form showing the nature and mailing dates of various routine reports required was prepared and distributed, and in the accomplishment of the same purpose a standard form of follow-up letter to be used in case of delayed replies was also devised.

The publication of the monthly Lighthouse Service Bulletin, describing the principal events in the Service of interest and importance to officers and employees, was continued throughout the year. The publication of this bulletin was commenced in January, 1912.

The study of the most useful size and arrangement of light and buoy lists was continued, and consideration given to efficient and ready methods of keeping copy for the printer corrected to date, in order to prevent delays in publication. Toward the close of the fiscal year arrangements were made for printing buoy lists in octavo size, which it is believed will extend the usefulness of the publications by providing the information in a more compact form and at lessened cost.

A new edition of the regulations, embodying all changes and amendments made in the former edition of 1911, was issued on October 1, 1914.

A standard method of cost keeping has been continued in effect throughout the fiscal year, and reports have been received from

all the districts, in which itemized costs of each office, depot, light and fog-signal station, tender, and light vessel are shown separately. Beneficial effects of this systematic method of keeping costs have been shown by a gradual reduction in the cost of maintenance of a number of classes of aids to navigation as compared with figures for previous years.

There has been increasing difficulty in obtaining competent seamen and other members of crews for lighthouse vessels in recent years, and as a result lighthouse tenders engaged in important buoy work have not been able, in some cases, to maintain a full crew, or have had their crews made up largely of inexperienced men. A table showing the authorized complements of seamen, firemen, and mess attendants on board lighthouse tenders, with the number of changes that have taken place in such positions during the fiscal years 1913 and 1914, is appended, which indicates clearly the difficulties encountered in attempting to do the work of the Lighthouse Service under the present scale of wages for these persons.

APPROXIMATE NUMBER OF CHANGES OCCURRING AMONG AUTHORIZED COMPLEMENTS OF SEAMEN, FIREMEN, AND MESS MEN ON LIGHTHOUSE TENDERS DURING THE FISCAL YEARS 1913 AND 1914.

District.	Tender.	Seamen.			Firemen.			Mess men.		
		Authorized complement.	Changes.		Authorized complement.	Changes.		Authorized complement.	Changes.	
			1913	1914		1913	1914		1913	1914
1st.....	Hibiscus.....	7	27	22	6	23	12	4	5	3
	Zizania.....	6	8	0	4	17	22	4	1	4
2d.....	Anemone.....	7	17	19	6	23	23	4	5	4
	Azalea.....	6	9	9	4	8	1	4	3	1
	Mayflower.....	6	44	18	6	10	10	4	5	8
3d.....	Daisy.....	2	3	2	1	1	0	1	2	4
	Gardenia.....	6	21	42	2	5	11	3	5	13
	John Rodgers.....	6	21	14	4	7	9	4	4	1
	Larkspur.....	6	14	19	6	10	5	4	6	16
	Mistletoe.....	6	18	48	4	4	6	4	7	13
	Pansy.....	6	7	8	4	3	4	4	5	16
	Tulip.....	8	25	11	6	33	13	4	13	21
4th.....	Iris.....	6	35	25	4	8	6	4	2	1
5th.....	Holly.....	6	5	6	4	5	5	4	1	2
	Ivy.....	6	5	23	6	7	13	4	4	9
	Jessamine.....	6	11	10	4	5	4	4	5	0
	Juniper.....	2	1	3	2	0	6	1	1	0
	Maple.....	6	6	19	6	15	27	4	0	4
	Orchid.....	7	16	14	6	33	17	4	8	12
	Woodbine ^a	2	.....	3	.....	.....	.....	1	.....	1

^a Not in commission during fiscal year 1913.

APPROXIMATE NUMBER OF CHANGES OCCURRING AMONG AUTHORIZED COMPLEMENTS OF SEAMEN, FIREMEN, AND MESS MEN ON LIGHTHOUSE TENDERS DURING THE FISCAL YEARS 1913 AND 1914—Continued.

District.	Tender.	Seamen.			Firemen.			Mess men.		
		Authorized complement.	Changes.		Authorized complement.	Changes.		Authorized complement.	Changes.	
			1913	1914		1913	1914		1913	1914
6th.....	Arbutus.....	6	16	28	4	25	17	4	8	4
	Cypress.....	7	30	29	6	12	21	4	4	0
	Mangrove.....	6	20	27	6	9	6	4	6	9
	Snowdrop.....	1	1	0				1	0	0
	Water Lily.....	1	1	2				1	0	0
7th.....	Magnolia.....	6	38	16	6	52	14	4	6	1
8th.....	Camellia.....	4	24	51	3	5	16	3	13	9
	Lilac.....	6	11	41	6	11	25	4	10	10
	Sunflower.....	6	17	15	6	7	11	4	8	5
9th.....	Myrtle s.....	6		11	4		5	4		0
10th.....	Crocus.....	b 3½	32	31	b 5½	45	48	b 3½	7	8
11th.....	Amaranth.....	b 5½	40	15	b 3½	12	15	b 3½	6	7
	Aspen.....	b 3½	18	17	2	4	11	2	7	13
	Clover s.....	b 3½		11	b 1½		13	2		8
	Marigold.....	b 3½	34	33	b 3½	22	22	b 3½	14	6
12th.....	Hyacinth.....	b 5½	11	23	b 3½	12	22	b 3½	1	5
	Sumac.....	b 5½	5	7	b 5½	13	12	b 3½	3	14
13th and 14th.	Goldenrod.....	6	15	6	2	3	2	4	34	15
15th.....	Oleander.....	6	18	12	3	10	6	4	15	9
16th.....	Columbine.....	7	52	19	6	3	6	4	20	27
17th.....	Heather.....	7	16	20	6	11	17	4	6	3
	Mansanita.....	7	22	19	6	24	26	4	17	9
18th.....	Madrono.....	7	11	13	6	16	6	4	13	21
	Sequoia.....	7	46	17	6	27	13	4	19	17
19th.....	Kukul.....	6	14	8	6	14	10	4	7	3
	Total.....	249½	785	786	191½	554	538	157½	306	336

a Not in commission during fiscal year 1913.

b Fractions result from members of crew being authorized for portion of year only.

Cooperation.

Special effort has been continued to consult the needs of maritime interests as to aids to navigation and to cooperate with other branches of the Government having interest in or relations with the work of this Service.

Cooperation with the United States Engineer officers in charge of river improvements in the river districts has been continued with entire success.

Cooperation with the Navy Department was extended by the promulgation of joint regulations dated January 20, 1914, gov-

erning repairs to vessels and obtaining of marine stores at navy yards and naval stations.

The facilities of Navy Department radio stations for the transmission of official radiograms, both from shore and vessel stations, were extended to the Lighthouse Service.

Arrangements were made with the Treasury Department for the detail of officers of the Public Health Service, when available, for inspection of the sanitary conditions and general health of employees at isolated stations and on vessels.

Joint regulations covering the lighting of fish pounds, to be included in permits which may be granted by the War Department for the erection of fishing structures and appliances, were issued during the year.

Arrangements were made to cooperate with the Department of Agriculture in enforcing the regulations for the protection of migratory birds approved by the President on October 1, 1913, by furnishing copies of such regulations to keepers and other employees and directing them to report violations promptly.

Instructions were issued to furnish the Department of Labor, at stated intervals, data regarding subcontracts on contract works of construction and repair in force in the Lighthouse Service.

Instructions cooperating with the Treasury Department for standard sizes and rules regarding towels used in public buildings were issued.

Arrangements were made for the recovery of valuable buoys adrift on the high seas by cooperation between the radio stations of the Navy Department and revenue cutters of the Treasury Department cruising in the vicinity of such drifting buoys.

Arrangements were made for cooperation with the Revenue-Cutter Service, Treasury Department, whereby wrecks discovered by that service on the Florida Reefs will be promptly reported to the proper lighthouse inspector, to permit issuing a notice to mariners in order that vessels navigating in the vicinity may not be misled as to their own positions.

Cooperation with the Bureau of Navigation, Department of Commerce, was also arranged, whereby vessels of that Bureau will notify the nearest lighthouse inspector, by radio, when practicable, of any defects observed in aids to navigation.

Legislation Affecting the Lighthouse Service.

In addition to the maintenance appropriations for the current fiscal year, appropriations for the following special works have been made since the close of the year 1914:

Carpenter shop for the general lighthouse depot, Tompkinsville, N. Y.....	\$23, 000
Completion of Kilauea Point Light Station, Kauai Island, Hawaii.....	3, 000
Aids to navigation in Alaska.....	60, 000
Aids to navigation at the entrances to the Cape Cod Canal, Mass.....	50, 000

Authority was granted by the act of March 9, 1914, for the leasing of an unused portion of the Ediz Hook Lighthouse Reservation, Wash., to the city of Port Angeles, Wash., for a period of 99 years, with suitable restrictions and safeguards.

The act of May 26, 1914, authorizing the Secretary of War to grant the use of the Fort McHenry Military Reservation, Md., to the city of Baltimore for park purposes, contained a clause excepting that portion in use by the Lighthouse Service, with the electric pole line leading thereto.

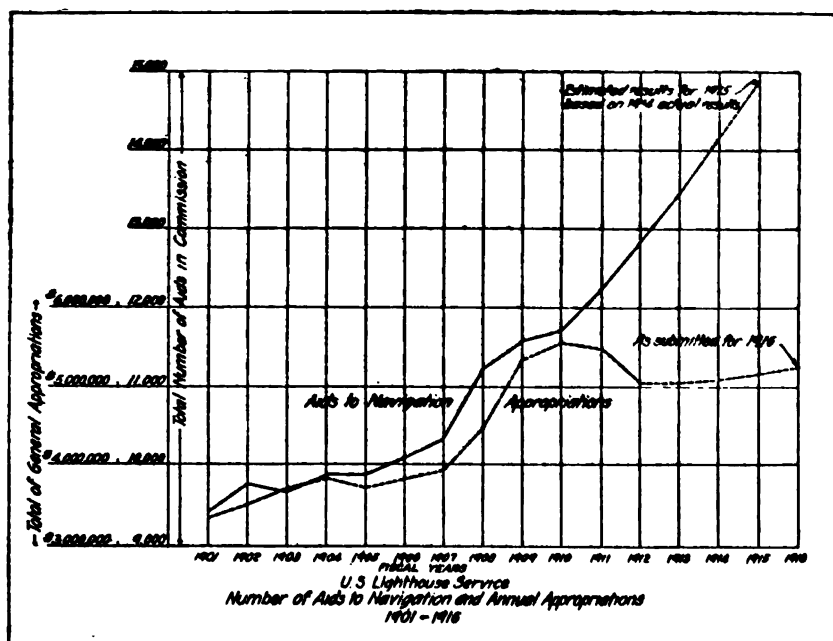
Appropriations.

The estimates for maintenance appropriations for the year 1915 were divided into one appropriation for general expenses of supplies, repairs, etc., and three appropriations for salaries, with a recommendation that consideration be given to the consolidation of all these appropriations into one. This alternative proposition, however, was not authorized by Congress. It is believed that with this form of appropriation a more economical and efficient administration of the Lighthouse Service could be effected, and in the estimates for the next fiscal year attention has been drawn to the fact that, if this consolidation is authorized, a reduction of \$25,000 on the total estimates may be safely made.

Besides the estimates for maintenance, estimates for 27 special works have been submitted, aggregating \$1,493,500. These include—

- 2 new lighthouse tenders.
- 7 new light and fog-signal stations.
- 3 new light stations.
- 1 new lighthouse depot.
- 4 items for establishing or improving aids in general localities.
- 1 item for a new system of harbor or channel lights and other aids.
- 5 items for improvements of light or fog-signal stations or of groups of aids to navigation.
- 3 items for improvement of lighthouse depots.
- 1 item for light keepers' dwellings.

Special attention is invited to the fact that the appropriations for special works in the Lighthouse Service for the fiscal year 1915 total only \$136,000, while the average amount for the 10 preceding fiscal years was \$946,927 annually. Practically all of the items submitted are the same as those submitted last year, on which action has not yet been taken by Congress. These items are all considered meritorious and urgent for the safety of shipping, and have been requested many times by navigators and maritime interests. In view of the increasing growth of the commerce of the country and the efforts now being made to extend it further,



it is believed that these appropriations should be made at the next session of Congress.

Aids to Navigation.

During the fiscal year ended June 30, 1914, there was a net increase of 677 in the total number of aids to navigation maintained by the Lighthouse Service, including 59 lights above the order of minor lights, 1 fog signal, 2 submarine bells, 270 day marks, 65 lighted buoys, 157 unlighted buoys, and 88 minor lights.

Fixed lights were changed to flashing or occulting at 67 stations. The illuminant of 37 lights was changed to incandescent oil vapor,

the illuminant of 25 lights was changed to acetylene, and the illuminant of 48 lights was changed to oil gas.

On June 30, 1914, there were maintained by the Lighthouse Service 14,198 aids to navigation, including 5,004 lights of all classes, and 567 fog signals, of which 48 are submarine signals. It is believed that the systematic methods of improvement and the use of modern apparatus in increasing the number and brilliancy of aids have been of value to the safety of commerce. Particular attention is invited to the fact that incandescent oil vapor is now used as the illuminant of 268 lights, embracing practically all the principal seacoast lights in the Service.

The following are some of the more important aids which have been established or materially improved during the past fiscal year:

Complete new and improved systems of lighted aids were established in Baltimore Harbor, Md., North Channel, Boston Harbor, Mass., and St. Marys River, Mich.

First-order lights changed to flashing or occulting: Cape Blanco, Oreg.; Cape Lookout, N. C.; Shinnecock Bay, N. Y.; North Head, Wash.; Cape Flattery, Wash.

Special improvements at Capes Hatteras and Lookout, N. C., included an increase in intensity and speeding up of the lens at Cape Hatteras, and the introduction of a three-mantle oil-vapor lamp with occulting screens to produce a more effective characteristic at Cape Lookout.

Horn fog signal established: Whatcom Waterway, Wash.

Fog bells established: Aunt Phoebe Rock, N. Y.; Fiddlers Reach, Me.; Sandy Point Breakwater, Conn.

Submarine bells added to existing gas and whistling buoys: Point Judith, R. I.; Manana Island, Me.; St. Johns Entrance, Fla.

Important gas buoys established: McCries Shoal, N. J. (whistle); Little Gull Bank, Md. (whistle); Cape Romain, S. C. (whistle); Charleston, S. C. (bell); Biscayne Shoal, Fla. (bell); Point Delgada, Cal. (whistle); Duxbury Reef, Cal. (whistle); Joe Flogger Shoal, Del. (bell); Blackfish Bank, Va. (whistle); Boulder Reef, Mich. (whistle); Molasses Reef, Fla.; Cortes Bank, Cal. (whistle); Cape San Blas, Fla. (bell); Point Partridge, Wash. (bell); Port Harford, Cal. (whistle); Port Inglis, Fla. (whistle).

Systems of minor aids and buoyage extensively rearranged or improved in important localities: Kennebec River, Me.; Cohasset

Harbor, Mass.; New Bedford Harbor, Mass.; Providence River, R. I.; Lake Champlain, N. Y. and Vt.; Elizabeth River, Va.; inland waterway, S. C., Ga., and Fla.; Charleston Harbor, S. C.; Savannah River, Ga.; St. Simon Sound, Ga.; Charlotte Harbor, Fla.; Anclote River, Fla.; Sturgeon Bay, Wis.; Prince of Wales Island, Alaska; Kuhio Bay, Hawaii.

Flashing gas lights established: Acetylene—Caines Head, Windy Bay, Pilot Rock, Woody Island, Point Elrington, Smith Island, Cape Spencer, Cape St. Elias, and Point Ellis, Alaska; Sandy Point Breakwater, Conn.; Great Kills, N. Y.; Newark Bay, N. Y. and N. J. (4 lights); Fishing Point, Va.; Fort McHenry, Md.; Cape Fear River, N. C. (2 lights); Eastern Triangle, Fla.; Galveston Bay, Tex.; Ludington North Breakwater, Mich.; Kewaunee, Wis.; Port Wing, Wis.; Redding Rock, Cal. Oil gas—Recors Point, Mich.; St. Marys River, Mich. (45 lights).

The fiscal year was marked by an unusual amount of storm damage, the greatest loss occurring in the extremely severe storm of November 8, 9, and 10, 1913, on the Lakes, during which light vessel *No. 82*, on station in Lake Erie about 13 miles southwest of Buffalo, N. Y., was lost with her entire crew of six men. This is the second instance in the history of the Lighthouse Service in which a light vessel has foundered on station, the previous occurrence being on August 23-24, 1893, when light vessel *No. 37* was lost on Five-Fathom Bank, N. J., with four out of six men on board. Search was immediately instituted for light vessel *No. 82*, but the almost continuous heavy weather which prevailed from the date of the storm to the close of navigation in December prevented favorable results. In the meantime sufficient wreckage, including both small boats, doors, portion of vessel's rail, etc., drifted ashore as to preclude any hope for the safety of the crew. The search was resumed with the cooperation of the United States Lake Survey, using a wire drag, as soon as weather and ice conditions permitted in the spring, and on May 9, 1914, the wreck was located about 2 miles northeast of her station in 63 feet of water. The hull was found apparently intact, though the interior appeared badly damaged. No bodies were found. Bids were invited for raising the vessel and delivering her afloat in Buffalo Harbor, and a contract was let as soon as practicable. The work was in progress at the close of the fiscal year.

In addition to the loss of the vessel, valued at \$50,000, damage amounting to about \$15,000 was done to various light stations and vessels in the Lake districts by the same storm.

Other noteworthy storms were the hurricane of September 2 and 3, 1913, in the North Carolina Sounds, which destroyed about 20 post lights and damaged other lighthouse property at a total loss of about \$6,000, and the storm of November 29, 1913, on the north Pacific coast, which damaged lighthouse property to the extent of about \$11,000. No lives of persons in the Light-house Service were lost in either of these storms.

In accordance with the plan outlined in the annual report for 1913 for distinguishing light vessel stations, international code-signal letters have been assigned to the various stations.

A further improvement in the standard form of Notices to Mariners was effected by printing, in the back of each weekly notice, a list of corrections affecting the light lists, arranged in the tabular form of the lists, for greater convenience in correcting the lists by clipping and pasting.

Amendments to the Regulations for Lighting Bridges were approved by the Secretary on April 29, 1914, and steps were taken at the close of the fiscal year for the printing of revised regulations embodying such amendments, which have the effect of making the regulations more flexible, conforming to new conditions which have arisen.

To insure more complete uniformity in the buoyage of the Service, arrangements were made for reporting spare gas buoys at regular intervals, as well as statistics showing the number, locality, and reasons in the cases of buoys not relieved each year. Instructions regarding the painting of striped buoys were also under consideration at the close of the fiscal year.

Alaska.

The total number of aids to navigation in Alaska, including lights, fog signals, buoys, and day marks, in commission at the close of the fiscal year ended June 30, 1914, was 319, including 108 lights, representing an increase of 71 lights since June 30, 1910, or nearly 200 per cent. The table following, which gives the total number of aids to navigation on June 30 of each year named, illustrates the progress in establishing aids in the Territory.

Aids.	1910	1911	1912	1913	1914
Lights.....	37	71	85	93	108
Fog signals.....	9	10	10	10	10
Buoys.....	84	105	122	136	137
Day marks.....	20	29	35	40	44
Total.....	160	215	263	279	319

The act of October 22, 1913, made an appropriation of \$115,000 for a light and fog-signal station at or near Cape St. Elias. On account of the late date in the season, no work was practicable until the season of 1914. A temporary light was established at Cape St. Elias on June 18, 1914, and preliminary survey made for the permanent station.

The act of August 1, 1914, appropriated \$60,000 for the establishment of aids to navigation and the improvement of existing aids in Alaska, and in order to take advantage of the comparatively short season, a study was made, prior to the passage of the bill, for the best utilization of these funds for additional aids in Alaska, so that within a few weeks after the act was approved it was possible to make arrangements for the establishment of 19 new aids which are all greatly needed.

The paramount need of the Lighthouse Service in Alaska is the estimate for an appropriation of \$250,000 for a new tender to replace the *Armeria*. This item appears as No. 1 in the Department's estimates for the fiscal year 1916. The *Armeria* was wrecked on May 20, 1912, by striking a submerged, uncharted pinnacle rock having but 15 feet of water over it. This rock was subsequently located with difficulty and found to be very steep on all sides, the depth dropping quickly to 5 and 6 fathoms, and it was estimated that the summit was about 3 feet square. There is in the Lighthouse Service no tender permanently assigned to Alaska. The *Columbine*, which is now serving there, was borrowed from another district and is needed where she belongs. Furthermore, she is not large enough to do the Alaska work adequately or to be entirely safe for the long voyages and unfavorable weather conditions. In connection with the establishment of the light and fog signal at Cape St. Elias, for which an appropriation was made by the act of October 22, 1913, a large lighted buoy is needed to mark the very dangerous southeast rock. A buoy suitable for this service weighs nearly 14 tons, and the maximum

lifting capacity of the tender *Columbine* is less than 7 tons, so that the establishment of this much needed aid must be postponed until a vessel of sufficient size to do the work efficiently is provided. The request for authority to enlarge the proposed new tender to a vessel costing \$325,000 as compared with \$250,000 was made for the following reasons: The Government is charged with the responsibility of providing supplies for the natives and other inhabitants of the Pribilof Islands. These supplies include over 500 tons of coal annually and a thousand tons of hay, grain, lumber, and all other stores and merchandise needed for the support of a community of some hundreds of souls.

The transporting of sealskins is also a matter which could be accomplished on the return trip of the vessel. Even with the present closed season enough seal and fox skins are obtained to make a value during the past year of \$72,000. In four years the hire of private steamers cost over \$83,000 for this work, which might be all done by the proposed new tender at a trifling cost by being made a normal part of her outward and inward trips.

It should also be borne in mind that the distances in Alaska are great. From Ketchikan to Unalaska along the coast is 1,400 miles; to Bristol Bay and the Yukon district is still farther. A vessel is needed of sufficient size, not only to keep the sea in rough weather and do her work, but also to have a coal supply sufficient to avoid making duplicate trips back and forth, and also to enable her to carry supplies sufficient for the entire coast, when it shall be fully lighted, without having to return and take a second cargo for lack of carrying capacity. It is also believed that the proposed vessel fitted with modern oil-burning engines would cruise under ordinary conditions at reduced speed with little additional operating cost over the vessel originally authorized. If a smaller vessel is furnished, with less fuel and cargo capacity, it is apparent that there would be an early need for a second ship in order to cover the district of Alaska, in which the coast line requiring protection is greater in length than the entire Atlantic and Pacific shores of the continental United States.

Engineering and Construction.

New works of principal importance under special appropriations completed during the fiscal year are as follows: Storehouse for oil, Woods Hole Lighthouse Depot, Mass.; Newark Bay lights, N. J.; Negro Point Light and Fog Signal, N. Y.; Buffalo

Breakwater, North End Light and Fog-Signal Station, N. Y.; Sand Island Light Station, Ala., protection by riprap; San Juan Depot, P. R., improvements; St. Marys River, Mich., lights; 38 isolated oil houses at light stations, and a dwelling for the keeper at Kauhola Point Light Station, Hawaii, were also completed.

Other important work in progress at the close of the fiscal year includes Rondout, N. Y., light and fog signal; Miah Maull Shoal, N. J., light and fog signal; Brandywine Shoal, Del., light and fog signal; Thimble Shoal, Va., light and fog signal; Atchafalaya Entrance Channel, La., aids to navigation; Galveston Jetty, Tex., light station; Navassa Island, West Indies, light station; Ashitabula, Lorain, and Cleveland, Ohio, light stations; Ashland, Wis., light and fog signal; Manistique, Mich., light and fog signal, and Cape St. Elias, Alaska, light and fog signal.

In continuation of the work of developing standard plans and specifications for minor structures, designs were completed for iron substructures on four, seven, and nine reinforced concrete piles, with specifications covering their construction and erection.

A new type of portable acetylene tank house has been built for use on pile dolphins where there is danger of the dolphin being damaged by collision or carried away by the ice. These houses are so constructed that they may be readily removed, with all gas apparatus, and are furnished with a float on a length of light chain, to mark the locality for grappling in case the structure is swept away.

The use of concrete in beacon structures has been further extended with success. Concrete beacons previously built in place of old wooden cribs have stood heavy ice with success, and several more have been built during the past year. Concrete, corrugated roofs have been installed at light stations and are a proven far superior to the sheet-steel construction formerly employed. In cases of destruction of tall wooden towers by the sea, they have been replaced with strongly braced reinforced concrete structures.

Improvement of Apparatus and Equipment.

As a result of the tariff reductions effected by the act of August 3, 1913, a lower rate of duty was effected on various types of imported apparatus.

Careful attention was given to the general improvement of the apparatus and equipment used at the light stations. Many articles and apparatus were replaced by better ones of various kinds and various parts were repaired.

Improved post lanterns, both one-day and eight-day types, were made up and are being put into service. Drawings showing the design and detail price lists were also prepared. Special care has been given to the production of a wind-proof lantern, which has been tested for months through many severe gales without the light blowing out.

A new type of oil-engine torch, generating an intense heat and permitting the starting of internal-combustion kerosene engines in six minutes from the time of commencing to heat up the torch, was manufactured at an economical cost. This quick-starting feature is of value in the event of sudden fog.

An experimental installation was made of concentrated filament electric lamps in parabolic reflectors for range-light purposes. The apparatus is so arranged that it may be run either by commercial current or storage batteries, and in the event of the failure of one, the other is automatically cut into circuit; also in case of the failure of a lamp, a duplicate is automatically lighted.

In several other localities where a reliable supply of current is available the use of electric lighting has been extended. These are in general equipped either with automatic duplicating devices for substituting new bulbs on the failure of a filament, or relays which operate signal bells and lights in the keeper's quarters in case of any trouble. In some cases storage-battery auxiliaries have also been provided. New types of reflectors, made of glass with reflecting surface on the back, have also been placed in service.

Arrangements have been made for installing small plants at lighthouse depots for cleaning buoys, by means of oil engines, air compressors, with tank, piping, and air tools, as it has been shown by experience that this method is preferable to cleaning by hand, the work being done better, in less time, and with less injury to the metal.

An acetylene fog gun was imported and installed at a light station for service test toward the close of the fiscal year. Mariners have been requested to report their opinions as to the practical efficiency of the device.

Arrangements have been made for the experimental installation of temporary unwatched acetylene lights for winter use at certain isolated stations on the Great Lakes, which, if successful, will permit the keepers to leave such stations under safer conditions and yet give service to belated mariners after the close of the regular navigation season.

REPORT OF THE SECRETARY OF COMMERCE

The use of thermostat alarms designed to call attention when the light burns either too high or too low has been continued with success.

The use of a new type of compound quick-opening whistle valve for fog signals has been extended, resulting in improvement of the signal and saving of compressed air formerly lost by leakage in older types.

Vessels.

Contract was awarded on September 5, 1913, for the national draft lighthouse tender *Laurel*, for service in the first light district. The vessel was launched at Baltimore, Md., on June 20, 1914, and will probably be completed during the present fiscal year.

Contract was awarded on April 17, 1914, for the light tender *Fern*, for service in the inside waters of the second light district (Alaska). The contractor began the construction of materials shortly after the close of the fiscal year.

The tender *Woodbine*, propelled by an internal combustion kerosene engine, was placed in commission in the first light district on March 1, 1914.

The continuance of the plan of systematic maintenance and minor repairs to tenders during the year has resulted in increased efficiency and better maintenance.

The construction of new light vessels No. 96 and No. 97 at Muskegon, Mich., was well advanced during the year. These vessels will be used on the Great Lakes. No. 96 was launched on April 21, 1914, and No. 97 on June 5, 1914. Both will be completed during the fiscal year.

Plans are in preparation for the construction of additional vessels No. 98 and No. 100 and several other light vessels. In connection with the design of new light vessels considerable work has been given to making an improvement in the construction for cleaning painting, and overhauling, and in the use of effect a considerable economy in maintenance of the vessels.

Saving of Life and Property.

During the fiscal year 1914, six vessels of the light service were requested and all of them performed duty satisfactorily in lighthouse service on vessels of a station. One of the vessels was of which is appended.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1914.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
1st....	Tender Hibiscus.....	Schooner Alice.....	Pulled vessel off rocks at Allen's Ledge, Me.
	Jerome H. Peasley, keeper, Crab-tree Ledge Light Station, Me.	Schooner-yacht White Wings.	Rendered assistance in getting yacht off rocks near station.
	Tender Zizania.....	Schooner Carrie May..	Towed schooner which in fog had anchored in dangerous position near rocks.
	James Burke, keeper, Cape Neddick Light Station, Me.	Launch.....	Towed to Cape Neddick Light Station launch that had become disabled, taking care of occupants overnight.
	Mitchell Blackwood, keeper, and Chas. A. Radley, second assistant keeper, Boon Island Light Station, Me.	Power boat.....	Rescued 2 men from being driven to sea in disabled power boat and brought them to light station.
	Heber O. Sawyer, keeper, Bear Island Light Station, Me.	Motor boat.....	With personal power launch picked up and towed 1 mile disabled launch with man aboard.
	James Burke, keeper, Cape Neddick Light Station, Me.	Samuel L. Lewis.....	Burke went to rescue of Mr. Lewis, taking him from water, furnishing him with dry clothes, and caring for him. Mr. Lewis states owes life to Burke.
	Tender Hibiscus.....	Schooner Harriet C. Whitehead.	Assisted tug Betsey Ross in pulling schooner off rocks.
2d....	Charles H. Jennings, keeper, Monomoy Light Station, Mass.	Power boat; owner, Theodore Drew.	Assisted in getting disabled boat to safe anchorage.
	Joseph B. McCabe, keeper, and C. B. Bassett, assistant keeper, Deer Island Light Station, Mass.	Steam launch from U. S. S. North Carolina.	Carried towline from tug to disabled launch. Party of men and women on board besides crew of 5 enlisted men.
	Shovelful Shoal Light Vessel No. 3, Mass.	Motor boat Chappaquiddick.	Four men taken off disabled boat and cared for on board light vessel overnight.
	John W. Davis, keeper, Annisquam Light Station, Mass.	Yacht Jack Tarr.....	Brought to shore 2 men from stranded vessel and furnished them dry clothing.
	Pollock Rip Shoals Light Vessel No. 73, Mass.	Power launch; owner, Leo H. Leary.	Picked up adrift.
	George E. Kezer, keeper, Lovells Island Lighthouse Depot.	Five fishing dories from schooner Olive F. Hutchins.	Schooner wrecked; recovered 5 boats adrift.
	Charles A. Baker, keeper, Butler Flats Light Station, Mass.	Motor boat; owner, Chas. E. Jones.	Saved boat from going to pieces on rocks; towed boat with 3 men aboard to wharf.
	Tender Mayflower.....	Tug Mary Arnold (owners, Ross Towboat Co.) and lighter R. G. No. 1 (owners, Rockport Granite Co.).	Vessels stranded; tender's launch towed lighter to anchorage and stood by tug until daylight; tender towed vessels to safe anchorage.
	Tender Anemone.....	Steamer Kiphas.....	Steamer grounded on Great Ledge, Woods Hole, Mass., lost her rudder, and was drifting with tide; towed to wharf by tender's launch.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1914—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
2d....	Chester E. Morris, second officer, tender Anemone.	.....	Went overboard to cut line that had become fouled in propeller; accidentally injured while 10 feet under water.
	Winfield L. Creed, keeper, Broad Sound Channel Light Station, Mass.	.....	Rescued man who was clinging to rigging of overturned boat; also brought to shore body of man drowned by the accident.
	Tender Anemone.....	Schooner Grace Darling.	Towed to harbor disabled schooner anchored in dangerous and exposed position and flying signals of distress.
	Tender Mayflower.....	.....	Picked up disabled fishing boat adrift with 5 men on board and towed it to harbor.
	Tender Anemone.....	Schooner G. M. Porter.	Schooner wrecked on Kill Pond Bar, Nantucket Sound, Mass.; crew of 3 men taken off and cared for on board tender overnight.
	Cross Rip Relief Light Vessel No. 9.	Schooner John Paul...	Crew of wreck picked up by light vessel, badly frozen, and cared for overnight; 1 man frozen to death.
3d....	Charles S. Curtis, keeper of Rose Island Light Station, R. I.	Power boat.....	Rescued men in disabled power boat fast going out to sea and towed boat to Newport.
	William L. Tutty, keeper, New Haven Light Station, Conn.	Power boat containing George Blumley and Arthur Sachl, New York Motor Boat Club.	Boat helpless from breakdown; towed to safety.
	William Tengren, keeper, Mussel Bed Light Station, R. I., assisted by his son.	Power boat.....	Rescued 2 women and 1 man from overturned boat.
	Edward M. Grant, keeper, Old Orchard Shoal Light Station, N. Y.	.....do.....	Went to assistance of disabled power boat at great risk; repaired its engine so party could proceed.
	George L. Costello, keeper, and Frederick C. Lovatt, second assistant keeper, Execution Rocks Light Station, N. Y.	Sailboat; R. Vogel, owner, New York.	Boat containing 6 persons on the rocks; women of party taken to lighthouse and made comfortable; boat towed to safety.
	Charles Rodiera, keeper, Point Comfort Light Station, N. J.	.....	Rescued Katherine Downey, 5 years of age, from danger of drowning.
	Edward M. Grant, keeper, Old Orchard Shoal Light Station, N. Y.	Power boat containing Messrs. Ulger, Oppicola, Bernau, Chaphrewitz, and Kived, all of Brooklyn, N. Y.	Boat containing men disabled $\frac{1}{2}$ mile off station; towed boat to station and gave men breakfast and dinner.
	Emil Usinger, assistant keeper, Great Captain Island Light Station, N. Y.	Sailboat; Walter J. Lyon, owner.	Ran upon rocks on northeast side of island; assistant keeper went to assistance of owner and 3 others and provided party with dry clothing.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1914—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
3d....	Willis A. Green, keeper, Bridgeport Harbor Light Station, Conn.	Motor boat of torpedo destroyer U. S. S. McCall.	Cared for man, a survivor of crew of 4, who swam to station from a motor boat belonging to the McCall, which was run down by steamer Seaboard.
	Charles Schoeneman, keeper, Newport Harbor Light Station, R. I.	Power boat belonging to contractor building a wharf at Rose Island.	Boat drifted on rocks on west side of torpedo station; 1 man rescued and boat secured to prevent breaking up.
	Hans C. Anderson, keeper, Barber Point Light Station, N. Y.	Steamer Pearl, 20-ton freight boat, with 3 men, Gen. La Ventine and Chas. Leplant, from Champlain, N. Y.	Ashore on a reef; assisted in getting boat off without apparent damages.
	Charles Redfern, keeper, Point Comfort Light Station, N. J.	Motor boat belonging to H. C. Smith, Marlboro, N. J.	Owner not able to navigate boat and lost his direction; brought ashore and boat secured.
	Wilbur M. Phumley, quartermaster, tender Mistletoe.	.....	Rescued Robert Lund, steward, who fell overboard.
	Tender Gardenia.....	U. S. Army mine planter, Gen. John M. Schofield.	Assisted vessel when aground off Ellis Island, New York Bay.
	Charles W. Oliver, keeper, and Alfred Nelson, assistant keeper, Great Captain Island Light Station, N. Y.	Power boat Rex.....	Two men taken off power boat powerless in gale; taken to station and fed.
	Cornfield Point Light Vessel No. 48.	Power boat.....	Sent boat to assistance of disabled power boat and towed it into Saybrook Point.
4th...	C. W. Atkins, master, lighthouse tender Iris.	Schooner Grace Seymore.	Pulled vessel off Brown Shoal, Delaware Bay, into deep water.
	Edw. W. Long, keeper, Old Reedy Island Light Station, Del.	.....	Rescued 3 young ladies, adrift in rowboat about 3 miles from station, and towed them to Augustine Pier.
	William Spear, keeper, Deep Water Point Range Front Light Station, N. J.	Motor boat Monacy of Chester, Pa.	Towed boat to port; 5 men aboard; repaired engine for them.
	Do.....	Motor boat Jennie of Bristol, Pa.	Towed disabled boat to port; 3 men and 2 women aboard; examined engine and located trouble for them.
	C. W. Atkins, master, lighthouse tender Iris.	Four-masted schooner Margaret Thomas of Boston, Mass.	Ashore on shoal above Fourteen-foot Bank; pulled her off into deep water.
5th...	Thomas Jacobson, keeper, Point Lookout Light Station, Md.	U. S. Navy flying boat C-1.	Rendered assistance to occupants when motor had become disabled.
	Tender Maple, Capt. Thomas J. Miles, commanding.	Gasoline launch Seaman's Friend, owned by Seaman's Friend Society of Norfolk, Va.	Towed disabled launch with 10 people on board to safety.
	Loch W. Humphreys, keeper, Cedar Point Light Station, Md.	La.....	Assisted launch with 4 men aboard while in distress.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1914—Continued

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
5th ...	Charles A. Sterling, keeper, Crumsey Island Light Station, Va.	Mrs. A. J. Smith, of Portsmouth, Va.	Recovered lady's watch accidentally dropped overboard
	Tilman F. Smith, keeper, Washington, N. C., lighthouse depot.	Lighthouse depot, Washington, N. C.	Saved boxes from police office from lighthouse depot in storm
	Daniel T. Paul, laborer in charge, Rumley Marsh Light, N. C.	Lighthouse property	Recovered lighthouse property after storm
	Robert H. Bertson, master, light vessel No. 80.	Light vessel No. 80....	Kept light displayed on light vessel with proper characteristics during storm
	Alonso J. English, keeper, and John M. Stowe, assistant keeper, Harbor Island Bar Light Station, N. C.	Harbor Island Bar Light Station, N. C.	Saved Government property in their charge during storm
	Mumford Gaym, keeper, and James O. Casey, assistant keeper, Pamlico Point Light Station, N. C.	Pamlico Point Light Station, N. C.	Do.
	Wesley Austin, keeper, Ocracoke Light Station, N. C.	Ocracoke Light Station and Ocracoke Island, N. C.	Saved the Government property in his charge and gave shelter to the residents of Ocracoke Island during storm
	John T. Shipp, keeper, and Thomas Quidley, assistant keeper, Neuse River Light Station, N. C.	Neuse River Light Station, N. C.	Saved the Government property in their charge during storm
	Alexander T. Loss, mate, light vessel No. 71, and crew of light vessel No. 71.	Light vessel No. 71...	Kept light vessel near her station during storm
	Herbert R. Brownley, first officer, tender Juniper.	Power boat A T Pioneer; owner unknown	Rendered assistance to a man who found the power boat which had become disabled near Norfolk in fog
	E. L. Thomas, keeper, Tangier Sound Light Station, Va.	Gasoline launch; owner unknown	Rendered assistance to disabled launch
	Tender Maple, Thomas J. Miles, commanding.	Schooner Corrie and Belle; owners unknown	Took over boat which was in trouble and towed her into harbor
	Mumford Gaym, keeper, and James O. Casey, assistant keeper, Pamlico Point Light Station, N. C.	Small gasoline; owners unknown	Rendered assistance to small boat which was in trouble
	E. L. Thomas, keeper, Tangier Sound Light Station, Va.	William A. Campbell, assistant keeper, Tangier Sound Light Station, Va.	Made repairs to the station light, as per the list of equipment furnished
	Randolph Scarborough, master, light vessel No. 75, and crew	Light vessel No. 75	Kept light vessel near her station during storm
	William C. Holliman, keeper, and Barney F. Paul, assistant keeper, Hatteras Island Light Station, N. C.	Hatteras Island Light Station, N. C.	Kept light vessel near her station during storm

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1914—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
5th...	Charles C. Tyler, keeper, and Gary E. Powell, assistant keeper, Great Shoals Light Station, Md. Tender Jessamine, master, Rufus A. Brooks, commanding. John B. Quidley, laborer in charge, Bogue Sound and Core Creek Lights, N. C. Ole O. Johnson, keeper, and Robert Kuhn, assistant keeper, Cobb Point Bar Light Station, Md. W. B. Clifton, keeper, and J. W. Cooper, assistant keeper, Roanoke River Light Station, N. C. Harry H. Wills, keeper, and Robert Williams, assistant keeper, Craighill Channel Range Rear Light Station, Md. W. H. Davis, jr., keeper, and J. M. Ellis, assistant keeper, Lazaretto Point Depot and Light Station, respectively, Md. C. A. Sterling, keeper, Craney Island Light Station, Va. Do.....	Gasoline launch; owned and operated by Horace Messick, Nanticoke Point, Md. Motor boat and schooner; owners unknown. Freight boat Georgie T, Capt. T. E. Gillikin. Lumber-laden power boat; owners, Olli Bailey and M. T. Wise, St. Marys County, Md. Launch Laura with a party of 4 persons aboard; owner unknown. Disabled gasoline launch; name and owner unknown. S. S. Charles H. Warner, man overboard from. Gasoline boat laden with potatoes; owner unknown. Gasoline boat Daisy; gasoline and sailing vessel Mary Sen; owners unknown.	Rendered assistance to party of 4 persons in disabled gasoline launch. Towed disabled motor boat to safety and floated beached lumber-laden schooner. Rendered assistance to disabled freight boat. Rendered assistance to disabled power boat. Rendered assistance to disabled launch. Rendered assistance to 8 men in the disabled launch. Rendered assistance to man, name unknown, helping in his rescue from drowning. Rendered assistance to disabled boat, saving her and cargo. Rendered assistance to both boats and prevented them from running down station.
6th...	Robert Cromley, assistant keeper, Sapelo Light Station, Ga. Kristofer Mathisen, first officer, and Gabriel Baeza, seaman, tender Mangrove. Iver Larsen, keeper, and Joel E. Hammett, assistant depot keeper, Castle Pinckney Depot, S. C.	..... ..... Dory No. 10, Carolina Yacht Club; owner, Mr. I. Ancrum Finley.	Picked up at sea a motor boat belonging to private individuals which had been stolen. Saved seaman on tender from drowning while relieving buoys, St. Catherine Sound, Ga. Rescued crew from overturned boat, righted boat, and towed same to Yacht Club; also landed crew.
7th...	Robert S. Meyer, keeper, and Clifton Lopez, assistant keeper, of Anclote Keys Light Station, Fla. Tender Magnolia..... Do	Power boats..... Steamer J. L. Luckenbach. Schooner Celia F.....	Rendered assistance to one party aground in launch, and to 8 men in disabled power boat. Assisted steamer, which was aground, into deep water. Towed schooner from dangerous position to deep water, saving schooner and cargo valued at \$700,000.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1914 -Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
7th...	Edgar J. Russell, keeper, Holton M. Roberts, first assistant keeper, and Theophilus Sawyer, second assistant keeper, of Dry Tortugas Light Station, Fla.	Steamer Venus.....	Brought crew of disabled ship to light station, and next day Assistant Keeper Roberts repaired engine of steamer to Key West, consuming 14 hours in the round trip.
	John Peterson, foreman, and H. P. Weatherford, keeper, of Fowey Rocks Light Station, Fla., with members of working party.	Schooner Alice B. Phillips.	Rendered assistance to disabled schooner.
	William Lester, keeper, and Jas. T. Williams, assistant keeper, of Gasparilla Island Range Light Station, Fla.	Power boats.....	Rendered assistance in saving two power boats which had gone ashore, and furnished shelter to men aboard.
	Tender Arbutus.....	Steamer Veehergen..	Rescued steamer off Panama Canal into deep water.
8th...	John Asplund, keeper; J. D. Balsille, first assistant keeper; Engvald T. Eriksen, second assistant keeper, Galveston Harbor Light Station, Tex.		Rescued two men in Galveston Bay, Tex., whose ship had become filled with water and was in danger of being destroyed.
	Charles W. Hearst, keeper, Halfmoon Reef Light Station, Tex.	Launch Nettle; owner unknown.	Towed disabled launch to port and furnished shelter and food with food.
	Tender Sunflower.....	Steamer Appelation; owner unknown.	Steamer had gone aground and tender helped her.
	George R. Smith, keeper, and Leon R. Smith, assistant keeper, of Red Fish Bar Cut Light Station, and Galveston Bay Light No. 2, Tex.		Rescued and cured five men from disabled ship. Also saved a large portion of cargo, and when weather improved got ship off sand with deep water.
	Do.....	Power boat Phoenix; owner unknown.	Brought to the light station 7 men, provisions, and crew of power boat, which had become ashore in sand.
	Tender Sunflower, and Henry Rhein, laborer, Mobile Depot, Ala.		Rescued steamer from running ashore.
9th...	Domingo Escobar Rosa, keeper, Guánica Light Station, P. R.	Flot boat.....	Assisted ship, whose light had gone out and was lost at sea.
	José P. Castillo, first assistant keeper, Mona Island Light Station, P. R.	Motor boat.....	Assisted party of 4 persons in a disabled motor launch and saved the crew and the property of a vessel to Key West in Mayaguez.
	Tenillo Ruiz, keeper, Culebras Island Light Station, P. R.	Schooner Maria Ludiva	Rescued unknown crew who were lost in the vessel. Crew had provisions and the light station.
	Manuel del Olmo, keeper and Agustin E. Cruz, assistant keeper, of Cape San Juan Light Station, P. R.	Fishing boat Puma	Rescued crew of fishing boat who were lost in the vessel.
	Tender Ivy	Ship Maritima	Assisted steamer in being refueled at sea in vessel and steamer not out to sea.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1914—Continued.

Dis- trict.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
10th..	Daniel D. Hill, keeper, Cross Over Island Light Station, N. Y.	Steamer John Lambert; owner, Great Lakes & St. Lawrence Navigation Co.	Brought master to shore in light- house launch when steamer ran on shoal about 1 mile from light sta- tion.
	Horace E. Walts, keeper, Sunken Rock Light Station, N. Y.	Launch Erin; owners, Messrs. Poole.	Furnished shelter for night and break- fast to 2 men and took them to Alex- andria Bay, N. Y.
11th..	George W. Smith, keeper; Samuel Massicotte, assistant keeper, Round Island (Straits) Light Station, Mich.	Motor boat; owner not known.	Motor boat disabled in gale; 1 man taken ashore by keepers in row- boat.
	William L. Campbell, keeper; Lewis B. Curtis, second assistant keeper; tender Aspen.	Point Iroquois Light Station.	Saved station from destruction by forest fires.
12th..	Ross F. Wright, first assistant keeper, Manitowoc Light Sta- tion, Wis.	Tug Duncan City.....	Saving property.
	William Gordon, first assistant keeper, North Manitou Light Station, Wis.	Power boat.....	Towed boat to safety; repaired ma- chinery, and supplied crew of 6 men with food.
	George J. Cornell, keeper, St. Joseph Pierhead Light Station, Mich.	Launch Wolverine....	Prevented stranding by getting a line to boat and assisted in getting boat into harbor.
	William H. Nash, second assistant keeper, Wind Point Light Sta- tion, Wis.	Hydroplane Fire Fly..	Rendered assistance to disabled ma- chine and helped tow it to shore.
	Edward W. Knudsen, keeper, Ra- cine Reef Light Station, Wis.	Motor boat.....	Towed into safety disabled boat with 4 people on board.
	Thomas Robinson, keeper, and Joseph Edlund, second assistant keeper, Muakegon Light Station, Mich.	Motor boat Ida L.....	Towed disabled motor boat to port.
	Emil C. Tews, first assistant keep- er, Waukegan Harbor Light Station, Ill.	Small boat.....	Rescued from probable drowning a duck hunter in a disabled boat in heavy sea.
	Tender Hyacinth, master, John K. Olsen.	Steamer Cepheus.....	Pulled into deep water; steamer was ashore.
	Reynold W. Johnson, keeper; Nels Nelson, first assistant keeper, and Martin Larsen, second as- sistant keeper, North Manitou Light Station, Mich.	United States Mail Service.	Rendered assistance to 2 men carry- ing the mail who had been caught in the ice, and furnished them food.
	Do	Gasoline launch.....	Rendered assistance in saving launch which had been driven ashore, and furnished clothing, board, and lodging for 4 days to the 2 men on board.
	Tender Sumac, master, Charles H. Hubbard; first officer, Harry W. Maynard; second officer, George K. Brown, and crew.	Dredge Marion and tug Erie.	During storm 9 men were rescued from sinking dredge, and water- logged tug was towed into port.
13th..	Leslie T. Hill, mate-carpenter, and William V. Bailey, quartermas- ter; tender Goldenrod.	.....	Went to assistance of drowning man.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1914—Continued.

Dis- trict.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
16th..	W. J. Pearson, assistant keeper, Scotch Cap Light Station, Alaska. Gas boat Monaghan, chartered by Lighthouse Service. N. S. Douglas, keeper, Lincoln Rock Fog Signal Station, Alaska. Tender Columbine, first officer, J. W. Leadbetter, in command. Tender Columbine, Wm. E. Gregory, master.	Henry Talplus, pros- pector. Launch, had no name; G. J. Dela on board. Small boat; Nick Ol- sen, owner. Small skiff; W. Wells on board. Cannery tender Chil- cote, owned by Chil- cat Cannery Co.	Subsisted detained man at station for 3 months. Picked up disabled launch in Stephens Passage and towed 6 miles to safe harbor. Stopped at the station seeking food, which was furnished. Picked up in Dixon Entrance and brought to Ketchikan. Mr. Gardner, superintendent of Chilcat Cannery Co., taken off wrecked vessel and carried to Haines.
17th..	Hans P. Score, keeper of Ship Point Light Station, Wash. Officers and crew of tender Man- zanita. Officers and crew of Columbia River light vessel No. 88, Oreg. (David Ingram, mate in charge). Clifford B. Hermann, keeper; Carl Lien, first assistant keeper; Anders G. Berner, second assistant keeper, Destruction Island Light Station, Wash. Officers and crew of Columbia River light vessel No. 88, Oreg. Clifford B. Hermann, keeper; Carl Lien, first assistant keeper; Anders G. Berner, second assistant keeper; Ralph J. Nead, third assistant keeper, Destruction Island Light Station, Wash. Officers and crew of relief light vessel No. 92, on Columbia River light vessel No. 88 sta- tion, Oreg. Michael Ludescher, assistant keeper, Burrows Island Light Station, Wash.	Gasoline launch Spirit. Launch Elsie; name of owner unknown. Launch Jack Burn- ham. Schooner Aloha, R. Pettersen, master; name of owner un- known. Unnamed launch; E. Berg and Chas. Lindstrom, owners. Launch Albatross; Ernest Fletcher, owner. Fishing boat O. 07394; name of owner un- known. Gasoline launch; name and owner un- known.	Rendered assistance to party of 3 men in launch, which had sunk about 5 miles from the station. Rescued a party of 6 persons from a disabled launch and brought them to port. Rendered assistance to disabled launch. Rendered assistance to officers and crew of the schooner Aloha an- chored in distress near station. Sheltered on board light vessel dur- ing stormy weather. Rendered assistance in floating and beaching a launch which had run on rocks and sunk near the sta- tion. Picked up boat, gave men food, and turned them with their boat over to tug. Assistance rendered to party of 7 persons in launch disabled near the station.
19th..	Tender Kukui..... Do.....	Dredge Governor; Hawaiian Dredging Co., Honolulu, Hawaii. S. C. Allen; Allen & Robinson (Ltd.), Honolulu, Hawaii.	Helped to extinguish fire when dredge was burning. Assisted in an effort to pull the Allen off the reef at Diamond Head, Oahu; vessel lost.

COAST AND GEODETIC SURVEY.

Extent and Efficiency of Service.

It has already been said that this is the greatest service of its kind in the world, and this is true. It has also been stated that the quality of its work is as high as its extent is vast, and this is also true. There are several times as many miles of coast in Alaska alone as in the entire United Kingdom of Great Britain and Ireland. The surveying and charting of the Philippines is by itself a far greater task than is imposed upon France on all her own marine borders in Europe. The surveying of the Hawaiian Islands, of Samoa, Guam, and Porto Rico is a greater task than is that of like work upon the European coast of Germany.

Facing this page is a map on which Alaska and the United Kingdom of Great Britain and Ireland are imposed upon the area of the United States. It will surprise some to find on looking at it that the reach of the Alaskan and Aleutian shores east and west is equal to the distance from Charleston, S. C., to San Diego, Cal., and that north and south it covers as much distance as from the Canada line to that of Mexico. The legend on the map further shows that for over four times the work we have 80 less officers and men and 2,000 less tonnage, while, if launches be excluded, we have nothing like the efficient fleet Great Britain provides for a work less than one-quarter our own.

It has been said that this service costs more than any other of the kind in the world. It ought to do so, for it is a vastly greater service than any other. It, therefore, should cost more, several times more, if we are to measure up to our plain duty in the matter.

If, however, this service were *relatively* to cost more than that of other lands, it would not be strange. No suggestion has ever been made that this is so, but if it were not so it would be surprising. No private business run under the conditions that have been forced upon this service could long exist. Its wonderful record of scientific achievement and practical value to our commerce has not availed to provide it in some respects with the ordinary means of efficient working. It has, indeed, invented and made instruments of precision of the highest value and produced apparatus and machinery of unique merit; but it is still

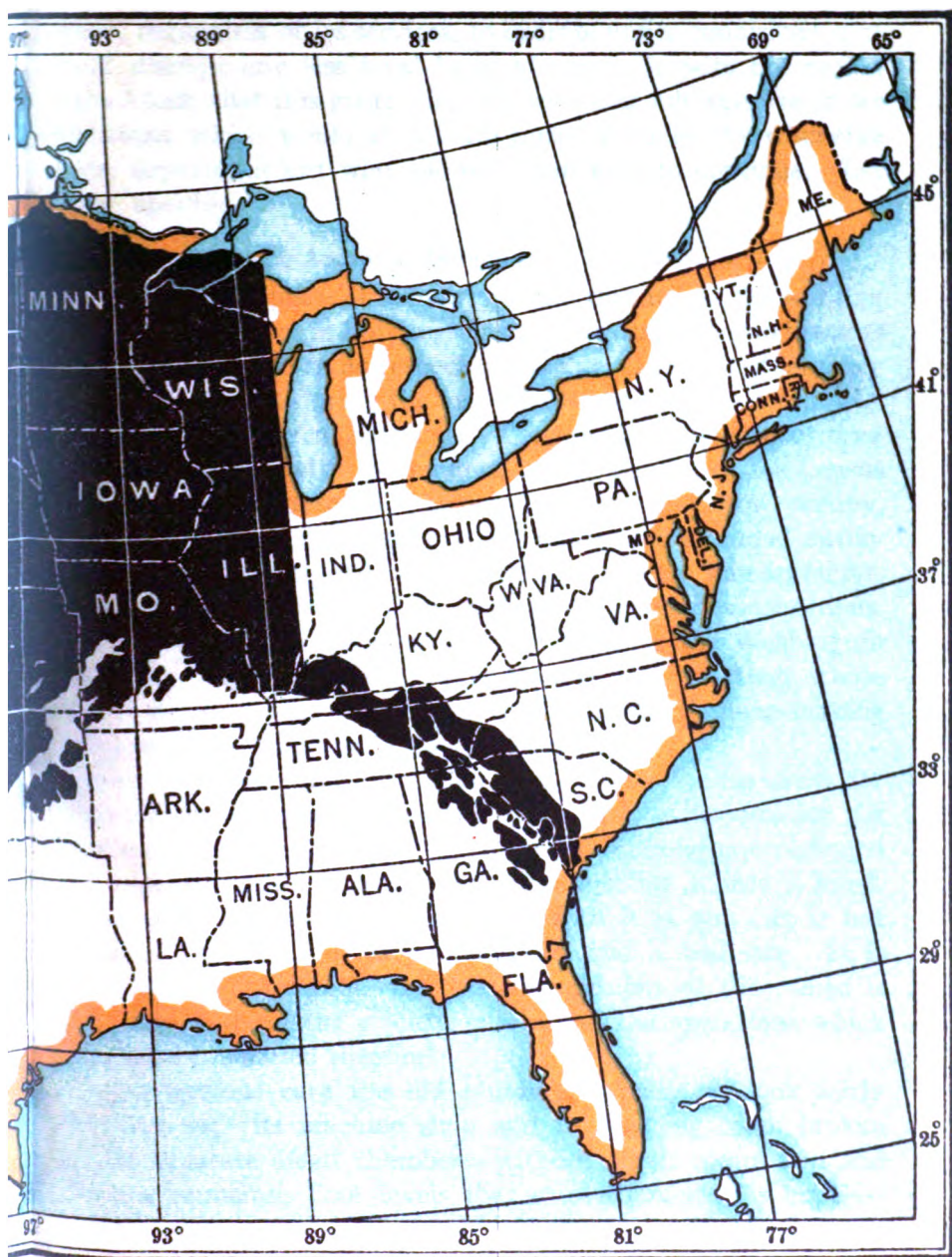
DIAGRAM SHOWING COAST LINE AND AREAS OF



FOR THE YEAR 1913	NO. OF SHIPS	TONNAGE
UNITED KINGDOM OF GREAT BRITAIN	6*	4460
U.S. AND ALASKA	11*	2448

* LAUNCH SIZE VESSELS EXCLUDED
" " INCLUDED

OF GREAT BRITAIN, UNITED STATES AND ALASKA



C. & G. S.

AGE	OFFICERS AND MEN	RELATIVE LENGTH OF COAST LINE
60	420	1
48	340	4.3

forced, regardless of its services, to operate under conditions that would disrupt any less loyal body of men. It puts the nation to the blush that this great scientific service should operate under conditions which would in private business cause the discharge of the superintendent who allowed them long to continue. Let me be specific.

Inadequate Housing Accommodations.

It is a commonplace of industry to-day that unless the working force be well housed in buildings suitable for its work good results can not be had, and in no respect has the development of industry been more marked during the last decade than in the design and construction of efficient buildings. Congress has wisely recognized this in connection with the removal of the Bureau of the Census from its former wretched quarters to those they now occupy, whereby at once a direct saving was made in the annual outlay and an increased output of work secured, while the human factor, the employee, is permitted to work under righteous conditions.

With like wisdom Congress has provided for the Washington post office and the Bureau of Engraving and Printing, whose work is not more exacting than that required by the map-making processes of the Coast and Geodetic Survey.

Often heretofore has attention been called to the need for adequate accommodations for the offices and workrooms for the Coast and Geodetic Survey. The principal building now occupied was originally built with the idea of converting it into a hotel. It was not intended for the use to which it is put. It is not suited to that use. It is a makeshift, and a bad one. It is insanitary, not fireproof, and the arrangement of the rooms is such as to prohibit the efficient conduct of the operations which have to be conducted therein.

By scrupulous care the old building is made to look fairly well, but with its machine shop and its drafting room broken up into separate small chambers, without direct connection and with the numerous floor levels that exist therein, it is hopeless to look for economical labor. The outlay of money to make it right would not be an expense, but an investment. Wise expenditure is here, as elsewhere, true economy.

What has been said about levels suggests the curious state of affairs which exists in this ill-assorted group of buildings. There are 16 different levels in the Richards Building, though it is but

6 stories including basement. There are 10 different levels in the Butler Building, though it is but 5 stories including basement. In the printing office are 7 different levels, and in the carpenter shop 3. In these days, when it is a commonplace that such conditions are to be avoided, this state of affairs can only be permitted to continue on the assumption that the waste it causes is either unknown or desired, or that the country lacks the means to correct it. The facts are now made known. The Department does not desire them to continue.

Not only is the main building, which was erected more than 40 years ago, not fireproof, but that in which the records are stored is little better. There is constant danger of the destruction of valuable records, of engraved plates, and of costly instruments by fire.

The walls of some of the buildings, after being twice condemned by the authorities of the District of Columbia, were shored up to keep them from falling. An appropriation of \$12,500 was granted during the current fiscal year to correct this condition and the plans for the repairs have been approved. The buildings have been the subject of a recent report by the Public Health Service. The officer making the inspection for that Service condemned the sanitary conditions of the buildings in strong but not exaggerated terms. With the exception of a few minor matters, which were immediately corrected, the conditions criticized are inherent in the buildings and can not be remedied until adequate accommodations are provided.

It goes without saying that the making of charts requires the best of light. Ample, well-diffused daylight is essential in order to deal properly with the fine details which are a necessary feature of the work. One finds it hard to read maps without good light; how much more to make the same maps? In this important respect of light, and not only in this respect but in those of heating, ventilation, and proper arrangements for supervision, the whole building plant is out of date and discreditable to the Government.

Replacing of Unseaworthy Vessels.

Faulty, however, as the buildings are which the Coast and Geodetic Survey is forced to occupy, some of the vessels which it is required to use are even worse. It is a shameful thing to send officers of the United States to sea in such ships as the *Endeavor*, the *Gedney*, and the *McArthur*. To require the continued use of these ships is but little removed in wisdom from a policy which

would refuse to build a modern battleship because the old *Constitution* was still in existence. With a loyal willingness to accept the dole handed them by a great Government, the service has continued these ships in use. It can do so little longer. By the time new vessels can be built to replace them it will be a grave question whether these ships can be sent to sea at all and whether the important work they do must not be stopped till safe vessels are provided. I have personally examined the three ships of which I speak—the *Endeavor* at Lewes, Del., the *Gedney* at Seattle, Wash., and the *McArthur* at Bremerton, Wash.

These ships have earned an honorable repose. I trust they may survive to get it without carrying with them ere it is gained the officers and crews whose misfortune it is to be continued in their use. If for a moment it were conceded, which it is not, that the Coast and Geodetic Survey was itself negligent and extravagant, there would still remain no reasonable excuse for the continued use of these ships. They are expensive luxuries, costing largely for maintenance, extravagant in the waste of time and fuel and likely to be even more extravagant in the waste of lives.

These old, obsolete ships, without wireless equipment and deficient in many modern appliances, can not be safely used except in protected waters. The expense of repairing them is great and becoming greater. The *Endeavor*, now working in sheltered waters on our Atlantic coast, can not be sent to the Pacific, since she could not survive the voyage. The steamers *Gedney* and *McArthur*, while still employed on surveys in sheltered waters in the Pacific, are unfit for the service. These three steamers are, respectively, 52, 39, and 38 years old, are single-screw, single-cylinder, and single-boiler coal-burning vessels, without electricity for wireless or for lighting, without refrigerating plants, without condensers to make fresh drinking water, and with quarters such as were, indeed, permissible at a somewhat remote age in our marine development but which, like their other equipment, are now medieval.

The *Endeavor* is a relic of the Civil War and was built in 1862 as a Confederate gunboat. She cost \$20,467 in 1867. The main deck is about 2 feet above the water line and on it is built a light, wooden superstructure, which includes the entire space to the rail on both sides. In this inclosure are 12 square windows, 22 inches by 21 inches, 6½ feet above the water line, with ordinary one-eighth inch thick window glass. Although, with due regard

for her venerable years, a fairly good sea boat when running head on, or before the wind, yet with her low freeboard and open gangways the main deck is more or less filled with water in a moderate sea, while a sea 4 or 5 feet high will break over the bulwarks. With an ancient engine of a single-cylinder, keel-condensing type, such as sensible men everywhere else have long discarded, the *Endeavor* will at full speed, under favoring conditions, make 8 knots per hour. With a head wind and a seaway, however, she will at full speed not exceed 5 knots per hour. In a heavy sea, such as is common along our shores, she will make little or no headway at all.

The vessel is 111 feet long, 18½ feet wide, and draws, loaded, 8½ feet of water. Because of her superstructure, with the boats thereon, with such a narrow beam, the vessel is top-heavy, and if caught outside in bad weather she has neither speed nor power to make a harbor. It is doubtful if in half a gale of wind she has power enough to keep head to the sea. The afterhouse, inclosing the cabin and wardroom, will not stand much battering and the windows therein have been smashed by a moderately heavy chop sea, such as is common in Chesapeake Bay.

It seems needless to say that this ship has no modern conveniences. None of these vessels has. Her quarters are both inadequate and insanitary. The officers are crowded in an open wardroom, used alike for sleeping, eating, and living, with the lavatories in the same room. They are without a bathroom.

The crew of 15 men must live, eat, and sleep in an open space 29 feet long by 13 feet wide by 6¼ feet high. This is ventilated by a hatch and two small pipes, one on each side. There are no windows. The hammocks hang directly over and a little above the table from which the men eat. Four petty officers are quartered in two small staterooms on the main deck and two men sleep in the shaft alley.

I protest, in the name of ordinary decency, against being obliged to continue such a vessel in service.

The storage room for the ship's supplies, provisions, and fresh water is entirely inadequate for convenience, for health, and for economy. The average annual cost for repairs to this vessel during the last 10 years has been \$2,123, a total of \$21,229.47, or 104 per cent of the original cost, in one-fifth of the time she has served. The same average amount will be required for repairs at the close of the present season's work.

She is quite as unfit as a working tool for the duty she performs as she is in other respects. She steers by hand. Her windlass is operated by hand. She is altogether an admirable example of what a vessel for this purpose ought *not* to be. If she were a living man instead of a dead vessel, she would be granted an honorable pension and sent to a soldier's home.

From this ancient and honorable veteran we pass to the steamer *McArthur*, which is one of the means the service has for the truly colossal task of surveying and charting the coast of Alaska. This vessel is 115 feet long, 20½ feet wide, and 12 feet draft loaded. She has a single-cylinder engine which, when conditions are good, will drive her 8 knots an hour at full speed, and against a moderate sea at 6 knots. She has not sufficient power to safely weather a heavy storm in open waters. The design and type both of engine and hull are long out of date. They were both built in 1874. The boiler was built in 1889 and was then designed for a pressure of 110 pounds. Its safe limit now is 80 pounds. The vessel's captain advises me that a similar hull equipped with a modern high-pressure boiler and engine would be propelled at a saving of nearly 50 per cent over the present motive power of the *McArthur*, but that the installation of modern machinery in the vessel is not justified in view of her great age.

The hull, like that of the *Endeavor*, was solidly built and is still in fair condition, but the deck of the superstructure is light and weak. This vessel has been used for 38 years, and during the last 10 years the average cost for repairs has been \$3,123, a total of \$31,234, or 56 per cent of the original cost, which was \$55,000. She has reached that stage, therefore, where in a quarter of her working life it has cost one-half of her original expense to keep her fit for service. Not less than \$2,000 will be required for repairs at the close of the present season's work. She is not in good condition for her service and should not be assigned to any duty where she will be subject to severe strains.

On this ship also officers live, eat, and sleep in an open ward-room, used also for an office and drafting room, and there is no bathroom. The ship has no electricity or evaporator to make fresh water and no refrigerating plant. Her storage and coal capacity are too small for work at a distance from supplies. The weak deck and superstructure have been strengthened by iron stay rods. She may hang together a while longer, but if in her duty she is caught suddenly in a heavy sea there is a good chance of her never coming back.

A few other details of the *McArthur* will show the generous(?) attention with which this service has been treated. One of the staterooms for petty officers on that ship is $8\frac{1}{2}$ by 4 feet and contains two berths, which the boatswain and carpenter occupy. Another is $5\frac{1}{2}$ feet by 11 feet and contains three bunks and a washstand. A third room is 12 feet by 5 feet and contains four bunks, and the fourth and last is occupied by the steward and the two cooks and contains three berths in a space $5\frac{1}{2}$ by 7 feet. For the crew a washstand is provided with three basins for 18 men. There is no bath or shower either for the crew, the petty officers, or the firemen. There is no place to carry fresh meats or vegetables for the crew. When the crew have fresh meat it is hung over the windlass until it is used up.

The captain states that in surveying equipment the *McArthur* has always been deficient. She was built before launches were available and her superstructure is so frail that a suitable steam launch can not be hoisted on board. Consequently, as she must use a launch for surveying work, an anchorage has to be selected where the launch is safe overnight afloat because the ship is not strong enough to hoist it on board. Frequently, therefore, the launch is towed to a safe harbor in the middle of the night because it can not be hoisted. Since it is impracticable to tow the launch long distances outside of sheltered waters, the *McArthur* is obliged, when making surveys at a distance, to go without her launch and resort to pulling boats. This increases greatly the cost of her work. A proper equipment for a vessel in this service would be two efficient steam launches. The *McArthur* has but one and that she can not hoist on board.

The last of this trinity of weaklings is the steamer *Gedney*. This vessel also we are required to use in Alaska, though she is dangerous when it blows. The *Gedney* is 140 feet long, $23\frac{3}{4}$ feet wide, and draws, loaded, $8\frac{1}{3}$ feet. The hull and engine are both of a design and type long out of date. Both were built in 1875 and have been in regular use for 39 years. The old, single, vertical, direct-acting engine, which any modern factory would throw in the scrap heap rather than use longer, can under favoring circumstances drive the vessel at an average speed of $7\frac{1}{2}$ knots per hour. As every engineer knows, this old single-cylinder type is likely to be caught "on the center," a dangerous situation when in close quarters or in a heavy seaway, as it temporarily deprives the vessel of her power.

The hull, which is composite, with iron frames and wood planking, is weak. The frames are thin in places and the deck is old and worn. The ship can not be safely assigned to any duty where there is severe strain. The average annual cost for repairs during the last 10 years has been \$2,160, a total of \$21,600, or 34 per cent of the original cost, which was \$63,400.

It will be noted respecting these three vessels that the ship which cost the least has required the greatest outlay for repairs and the ship which cost the most required the least outlay for repairs. This is quite normal and points a warning against the expensive policy of purchasing secondhand vessels because they are cheap. There can hardly be a more expensive investment than a cheap ship.

The *Gedney* has, of course, no electricity nor any apparatus to make fresh water or for refrigerating. The petty officers have no mess room. The six officers of the ship are quartered in a small, open wardroom which answers the threefold purpose of sleeping, dining, and living. She has not storage room enough for the provisions necessary for an Alaskan season, making it necessary frequently to return to port at considerable expense. At the close of the present season about \$2,000 will be required to put the ship in as fair a condition as is possible for so old a vessel for another season's work.

The *Gedney's* commanding officer advises under date of August 21:

It is impossible to examine the iron plates used for diagonally strapping the frames, but it is safe to state that their strength is more than half gone.

Quite apart from the utter unfitness of these vessels for their work and from the danger of operating them in heavy weather is the fact that the slow speed of a surveying vessel in Alaska or along the coast of Oregon or Washington results in a costly waste of time. In executing the details of surveying there is constant necessity for landing parties at points distant from anchorage or from the rendezvous of the launches which are in use. The ship has to proceed from her anchorage with sounding or other work, must then return, pick up parties, and go back to the anchorage or to points where other parties are waiting. Often the working ground is 15 to 20 miles (2 to 3 hours' steaming) from an anchorage. In such a case a slow vessel loses an hour in the morning and an hour in the afternoon. On a working ground with such weather conditions as prevail off Alaska, where rain, fog, and gales prevent or

hinder actual results on from one-third to one-half the working days, it is within the truth to say that slow speed reduces the output of a vessel from 10 to 20 per cent.

The captain of the *McArthur* informs me that during the current season, 1914, on several occasions he has started one party out from the ship, then landed another 5 to 8 miles away, then run 20 miles to occupy a triangulation station. After the triangulation party returned to the vessel he had then to return to the original anchorage 12 to 14 hours after landing the first party. He states that "any of our commanding officers can cite numbers of seasons where the total time of running to and from work would amount to from 100 to 200 hours." The obvious costliness of keeping vessels at this service whose speed is but half that which is ordinary to-day is as wise as it would be to send a messenger on urgent business with instructions to walk rather than ride.

There is no doubt that the great work of surveying and charting Alaska is taking much longer and costing much more than it ought by reason of the unfitness of the vessels for their work. The vessels in our ocean service should have power sufficient to work off a lee shore in bad weather, to make every hour of good weather count for work upon the finished charts, to cut down to the utmost the time required for returning to port for coal or supplies, to tow other vessels in danger, or to render assistance when other vessels are in distress. The costliness of using boilers and engines of inefficient design on a coast where coal costs from \$8 to \$13 per ton is too obvious to need comment.

Poor, however, as these vessels are the Coast and Geodetic Survey is not provided with funds sufficient to use them all the time they should be available. A summary of employment of the *McArthur* during the fiscal year 1914 follows:

	Months.	Days.	Per cent of year.
Time in field work, including passage to and from work, July 1-Nov. 12, Apr. 22-June 30.....	6	20	55.5
Repairs, navy yard, Puget Sound, Wash., Feb. 19-Apr. 6.....	1	16	14.4
Boiler repairs at Seattle, Feb. 12-18.....		6	
Completing crew, outfit, adjusting compasses, etc., Apr. 6-22.....		16	4.4
Time idle, laid up for lack of funds Nov. 12-Feb. 18.....	3	2	25.5

From the above it is evident that the vessel was laid up for lack of funds to operate her 25 per cent of the entire fiscal year. This was during the period from November 12 to February 18,

when, of course, she could not be used in Alaskan waters. There was, however, abundant work for her to do along our Pacific coast, where she was laid up, which could not be done because there was not money to run the ship.

In the case of the *Gedney*, also, the time spent upon work was 8 months and 9 days; that needed for repairs was 21 days, and this ship also was idle 3 months for lack of funds. This, too, was in the winter season when she could not work in Alaska, but there was nothing save lack of money to prevent her working elsewhere.

Emphasis is laid upon these facts because before the Appropriations Committee of the House of Representatives a different view was urged. It is, however, the plain fact that even these poor instruments are not used for a large part of the time because there is not sufficient money.

It is not necessary to send these worn-out ships in winter to a great distance from their home port (Seattle) in order to find them useful occupation. There is plenty of work for them to do which lies close at hand. If quiet days can not be found in which to send them as far as San Francisco Bay, there is work enough to be done in the sheltered waters of Puget Sound, Grays Harbor, Willapa Bay, and the Columbia River. In some of these the shifting channels make resurveys necessary. They have not been made because the Department had not the means to keep these vessels in commission to do the work. They were, instead, laid up near by.

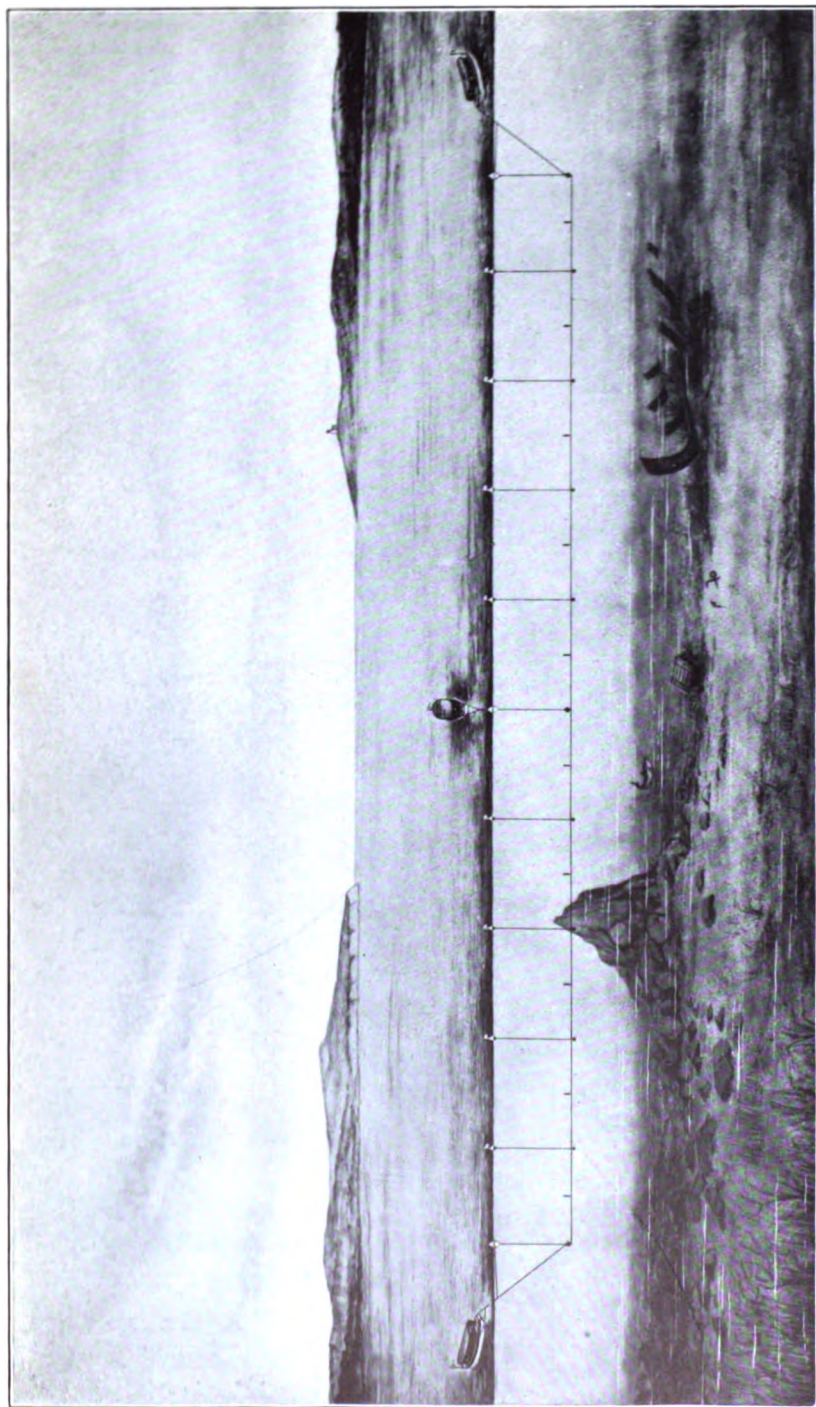
This is perhaps the place to add that there is a very large amount of survey work needed all along the Pacific coast, especially on banks and reefs as yet only imperfectly developed. Such are Blunts Reef, off Cape Mendocino; Heceta Bank, off the Suislaw River; and a bank 12 miles off Alseya River. The offshore work from the Mexican boundary all the way to Cape Elizabeth, Wash., a stretch of 1,200 miles, is incomplete, and there is one reach of 150 miles from Cape Blanco to Cape Lookout where no systematic work has been done. Detailed development work is needed off all the projecting points of the coast, such as Points Conception, Buchon, Lopez, Cape Mendocino, Eel River, Humboldt Bay, Trinidad Point, St. George, Cape Blanco, Cape Lookout, etc. The entire Pacific coast will not be as safe as it ought to be till this work is done. For it strong seaworthy vessels with ample power and wide steaming radius are necessary. Neither of the three old ships mentioned can be risked in such service.

It is proposed to replace these three vessels with staunch sea-going ships each 130 feet on the water line, about 500 tons, with twin screws, compound engines, two independent water-tube oil-burning boilers, electric plant for wireless signals, lights, and all auxiliaries, fresh-water condensers, refrigerating plant, etc. Sanitary and comfortable quarters and sufficient working space will be provided for the crews and officers. These vessels go on cruises of six or seven months' duration in places remote from settled regions, and they should carry an outfit and complement capable of meeting emergencies.

Three small steamers (large launches) are also required to take the place of launches now hired for wire-drag work on our Atlantic shore and to meet the constantly recurring demands for resurveys on that coast. These vessels will be each 75 feet long, twin-screw, with internal-combustion compound engines, from 90 to 150 horsepower, compressed air for auxiliaries, acetylene light, sanitary quarters, and with working space for four officers and eight men. At present the officers and men have to stay in hotels or boarding houses on shore. Such accommodations are often lacking near the working ground, causing a serious reduction of the available working time and increased expense.

A list follows of the vessels now employed by the Coast and Geodetic Survey.

Name.	Length.	Breadth.	Gross tons.	Where and when built.	Age.
<i>Employed on the Pacific coast.</i>	<i>Feet.</i>	<i>Feet.</i>			<i>Years.</i>
Gedney.....	140.0	23.8	244	New York, 1875.....	39
McArthur.....	115.0	20.0	290	Mare Island, 1876.....	38
Patterson.....	163.0	27.0	500	Brooklyn, N. Y., 1882.....	32
Cosmos.....	52.5	12.0	30	Mare Island, 1887.....	27
Yukon.....	75.0	15.7	38	New York and St. Michael, 1898.....	16
Taku.....	70.6	16.5	54	San Francisco, 1898.....	16
Explorer.....	135.0	27.0	335	Wilmington, Del., 1904.....	10
<i>Employed in Philippine Islands.</i>					
Pathfinder.....	168.0	33.6	690	Elizabeth, N. J., 1899.....	15
<i>Employed on the Atlantic coast.</i>					
Bache.....	153.2	26.2	370	Shooters Island, N. Y., 1901.....	13
Endeavor.....	111.0	18.5	130	Norfolk, Va., 1862.....	52
Hydrographer.....	101.0	19.5	116	Port Jefferson, N. Y., 1901.....	13
Matchless (schooner) ...	91.0	25.0	118	Key West, Fla., 1859.....	55



OPERATION OF THE WIRE DRAG.

Extension of Wire-Drum Service.

But the restrictions placed upon the Coast and Geodetic Survey through improper housing and ancient vessels are not all the burdens this service has to bear. It is not provided with the necessary apparatus for making the soundings which it is required by law to carry on and for which it exists. Sad experience has shown that the ordinary sounding apparatus will not detect that dangerous foe of the navigator—the pinnacle rock. On various points of our coast sharp spines of rock project from the bottom with points so small that a sounding line glances off. Two such have within recent years caused serious losses. One was the means of sinking the lighthouse tender *Armeria* on May 26, 1912, causing a loss of \$175,000, and another sank the steamship *State of California* on August 17, 1913, with a loss of 31 lives and \$150,000 value in property. Half the cost of these two wrecks used in surveying with the only apparatus for the purpose would have gone far to making the coast of Alaska safe. In cases of this kind the use of what is known as a "wire drag" is essential to make channels and harbors safe for vessels. There is no other method by which safety can be assured, and the extension of this work is an urgent necessity not only in Alaska but along other portions of our coast.

The wire drag is a device by which a long wire, maintained at any desired distance below the surface of the water, is towed over the area to be examined. The action of one of the many buoys which support the wire indicates the presence of an obstruction and its location. This device surely finds such obstructions. Nothing else will do so. As the speed at which such a device can be towed is but from 1 to 2 miles an hour, to which must be added the time taken in buoying the obstructions met and in determining their exact depth and position, the work is necessarily slow though thorough.

As large areas are involved, it is imperative that the work be taken in hand as soon as possible with as large a force as funds permit. A wire drag has been used during the open season of 1911 in the harbor of Portland, Me. The officer in charge of the work states that it has demonstrated—

That a number of submerged ridges lie almost across the track of vessels entering the harbor.

That the depths on these ridges are unequal many of the higher knobs constituting dangers to deep-draft vessels.

It further appears from the records of this work that—

1. It is now possible to select a safe channel for the deepest draft vessels.
2. Certain channels which were being considered for improvement have been proved unsuitable.
3. Harbor improvements may now be considered with a full knowledge of the conditions in the approaches.

In other words, the nature of the bottom of Portland Harbor, though often surveyed, is now for the first time accurately known and navigation and improvement may proceed intelligently.

A wire-drag party was organized in 1906 on the Atlantic coast, since which year it has worked in southern waters during the winters and in northern waters during the summers. In these eight years it has found 3,300 rocks with less water over them than the charts showed. Of these, 893 were distinct menaces to navigation. These last were distributed as follows:

Coast of Maine.....	400
Coast of Massachusetts.....	87
Block Island and Long Island Sounds.....	65
Coast of Florida.....	300
Coast of Porto Rico.....	25
Panama Bay.....	16

The Department requested of the Congress for the current fiscal year an appropriation to furnish vessels in place of the antiquated ships above described and also such an increase (from \$165,000 to \$225,000) in the appropriation for surveys in Pacific waters as would permit the operation there of a wire-drag apparatus. In this request the five steamship companies whose vessels navigate Alaskan waters joined. Both requests were refused. The owners of one of the steamship lines trading in Alaska, who have recently lost a valuable steamer on that coast, have announced their intention of withdrawing from one of their routes there its largest vessels until the surveys have been far enough advanced to guarantee safe navigation. It is needless to say that insurance rates on unsurveyed portions of the Alaskan coast are so high as to be almost prohibitive.

The plan of discovering hidden rocks by running vessels on them is still in vogue. This does not commend itself as a business proposition, apart from the humanity of the case. It has been such common practice, however, that rocks are commonly named after the steamer which hit them. For example, in Tongass Narrows, Alaska, are Idaho Rock, Ohio Rock, Potter Rock, and California Rock, each named after the vessel which discovered it by striking it.

The Department has endeavored to make plain the urgent need for funds for this vital work. The appropriation which was granted contained not an additional dollar for either purpose and is not of itself sufficient either to operate its existing old vessels the full period in which they ought to be used or to provide for wire-drag surveys anywhere on the Pacific coast.

In a schedule on a later page, showing in detail the use of funds by the Coast and Geodetic Survey on the Pacific, it will be noted that an allowance has been made of \$15,000 for wire-drag work in Alaska. This has been possible only by laying up our surveying steamers a still longer time in the spring, so as to permit diverting this money. In other words, having to work with insufficient funds we must leave some of our vessels idle longer than usual. Having informed Congress that this work with the wire drag is of vital importance in Alaskan waters, it is interesting to note what the results have been of the little we have thus been able to do. It has been confined to Tongass Narrows, Nichols Passage, and Revillagigedo Channel, Alaska, a distance of about 40 miles with widths varying from three-quarters of a mile to 5 miles.

Complete results of the work have not been received, but 14 pinnacle rocks that are a certain menace to navigation within this area have been found. These rise abruptly from depths varying from 5 to 100 fathoms, and are of a character which preclude their discovery by the ordinary methods employed in maritime surveying.

A little experiment in wire-drag work in this small area, which had previously been sounded with the lead line and is one of the most important highways for shipping in Alaska, has therefore developed in a few weeks' time 14 menaces to vessels that have been hitherto unknown. In 6 cases there were less than 8 feet of water over the pinnacles and in no case as much as 32 feet. In one case a rock that was less than 3 feet beneath the surface had 65 feet close beside it; in another case where the pinnacle was within 14 feet from the surface there were 162 feet beside it. The charts we have, which are based on surveys with the lead line, give no indication of these certain destroyers of ships, nor would the use of the lead line by the navigator give any warning. Being of small extent, rising almost perpendicularly from greater depths, they probably could never be found in surveying by the lead line. It would be a mere lucky chance if they were. There are two

methods known to find such dangers. One is that we have hitherto tried—it is that of finding them by running ships upon them. It is costly in life and property, but it is the only method which till now has been used. The other is to use the wire drag, but this, if well done, will cost something like \$60,000 a year. It will save ships costing many times that every year, as the records show.

It is well to have found these 14 pinnacles, but it points to a great and immediate need of more work of the same kind, and if one were to say stop your surveying steamers still more in order to do this wire-drag work, let the dead voices and the sunken ships from unsurveyed Alaskan shores give him their answer. Will the people of the United States regard with patience an attitude which says substantially, "Let ships go down and let the people drown. We can not afford either to keep our surveying vessels moving the season through or to provide the only form of sounding apparatus that in those waters is certain to insure safety." If we refrain from this necessary work, we must, as a nation, either confess poverty or indifference or deny the facts or allege that something else is of more value than human life. What shall the answer be?

As this report is written the urgent need for surveys and soundings in Alaskan waters is again accentuated by the loss of the United States revenue cutter *Tahoma*. The report of the captain commandant of the Revenue-Cutter Service on this accident is printed below, together with the letter from the Secretary of the Treasury transmitting same.

TREASURY DEPARTMENT,

Washington, October 5, 1914.

MY DEAR MR. SECRETARY: The captain commandant of the Revenue-Cutter Service has submitted to me a memorandum in connection with your letter of the 23rd ultimo, regarding the lack of proper survey of certain portions of the coast line of Alaska and its bearing on the recent loss of the *Tahoma*, and I am inclosing this memorandum for your information.

I quite agree with Captain Bertholf in his conclusions; the lack of correct charts makes navigation in Alaskan waters a hazardous undertaking not only for our revenue cutters but for all other vessels which are compelled to operate in that portion of our territory. It does seem that the Government should make more effort to have proper surveys made and charts drawn to cover all of our coasts. I hope you will be able to obtain sufficient appropriations to equip your Coast Survey with the proper ships to carry on this important work.

Sincerely yours,

W. G. McADOO.

HON. WM. C. REDFIELD,
Secretary of Commerce.

[Inclosure.

REVENUE-CUTTER SERVICE.

Memorandum for the Secretary,
From the Captain Commandant.
Subject: Incorrect charts of Alaska.

Referring to the accompanying letter from the Secretary of Commerce dated September 23rd, suggesting that the unfortunate loss of the *Tahoma* in Alaskan waters very pointedly illustrates the need for accurately charting that portion of our coast, the following is respectfully submitted.

The *Tahoma* was returning to Unalaska from a cruise along the Aleutian Chain, whither she had been dispatched to collect the shore parties that had been established at the islands of Atka, Kiska, and Attu to observe and guard against illegal operations on the part of sealing vessels. She left Attu, the westernmost island of the chain, either late on the night of the 19th or early on the morning of the 20th, and at 5 p. m. of the 20th she ran upon a reef. Complete information has not yet been received, but her reported position when she struck was 30 miles from the nearest island and where, according to the charts published, she had every reason to expect a depth of water in the neighborhood of 300 fathoms.

The steamer *Cordova*, bound from Nome to Seattle, was communicated with by radio and sent to assist the *Tahoma*; the Coast Survey steamer *Patterson* and the whaler *Kodiak*, which happened to be in Unalaska Harbor at the time, likewise proceeded to the assistance of the cutter. The *Cordova* picked up 30 miles from land one boat of the *Tahoma* containing 11 men, which had been at sea five days and five nights; another boat was picked up on the east side of Agattu Island; a third boat on the south side of Agattu Island; a fourth boat on the south side of the Semichi Islands, which are 20 miles north of Agattu Island; and on the 28th the *Patterson* recovered the three remaining boats of the *Tahoma*. All hands on the *Tahoma* were saved, but the vessel lies on an extensive reef with the decks just awash and is a total loss.

It is not surprising that the vessel struck an uncharted reef, for there are many such in Alaska; indeed the surprising thing is that our revenue cutters have navigated those waters for so many years with so few mishaps. In performing the duty of enforcing the law and the treaty for the protection of the fur seal and sea otter our vessels are forced to take many risks, since they must navigate with charts that are not only incomplete, but what is much worse, incorrect.

There are, of course, good charts of several of the harbors west of Unalaska which have been made at odd times by naval vessels and revenue cutters, but the general charts of the Aleutian Chain west of Unimak Pass are necessarily compiled from the only sources of information available, namely, the hasty and incomplete surveys of the early navigators. It is believed there is not a single island west of Unimak Pass correctly charted; the islands themselves are out of position; the coast lines are incorrect; and the soundings and outlying dangers are, for the most part, left to the imagination of the navigator. These facts, together with the ever present fog, make navigation in those waters a ticklish business, indeed, yet it must be done. To cruise a vessel in the vicinity of land under such conditions one must use extreme vigilance and prudence, and for the rest trust to the favor of Providence. In the experience of the writer several instances can be recalled where it was nothing but pure chance that his vessel did not strike an uncharted and invisible reef, the existence of which was discovered later.

The charts of the Alaskan coast east of Unimak Pass, while not by any means as correct and complete as the charts of the other coasts of the United States, are very good indeed compared with the charts of the coast west of Unimak Pass, and it was in this latter region that disaster befell the *Tahoma*.

Of course one can not be unmindful of the fact that there is at present practically no commerce west of Unimak Pass, and the further fact that with the exception of revenue cutters and an occasional trading vessel few American ships now sail those waters; nevertheless, this coast is a part of our territory, and with the prospective expansion of our commerce with the Orient there will undoubtedly be an increasing number of American vessels passing close to these islands while following the Great Circle course which takes them to Asiatic ports, and it would certainly seem that there is an obligation on the part of the Government to properly chart its own waters.

E. P. BERTHOLF.

OCTOBER 2, 1914.

Wrecks in Alaskan Waters.

If any further argument were needed to show the immediate necessity of further funds for the work of the Coast Survey in Alaska it should be found in the appended list, which is but partial, of accidents in Alaskan waters during the last 11 years. It should be recalled in reading it that during the latter part of this period navigation has greatly increased. The list includes no sailing vessels, of which many have been lost.

1903.—In August the steamer *Cyclone* was lost at Baron Koff Bay. Vessel was used as a lighthouse tender.

On November 1 the steamer *Discovery* was wrecked. Thirty lives were lost. Property loss about \$24,000.

1904.—On September 4 the steamer *Saidie* struck an uncharted rock off Cape York, Bering Sea, and sank. Estimated loss of property about \$80,000.

On November 23 the steamer *City of Seattle* struck an uncharted rock in Eagle River Harbor, Alaska. Was beached and temporarily repaired. Property damage about \$2,000.

1905.—On July 29 the ship *Star of Russia* struck on sand beach on Chirikof Island, Alaska. Was floated later and temporarily repaired. Estimated property loss about \$56,000.

1906.—On September 13 the steamship *Oregon* stranded on Hinshinbrook Island, Alaska coast, during heavy weather, and was a total loss. Estimated property loss \$150,000.

1907.—On March 19 the steamship *Northwestern* grounded on a reef at La Touche Island, Alaska. Damage \$35,000.

On May 25 the gasoline boat *Rita Newman* ran on the rocks at Simonefsky Island, Alaska, and was abandoned. The vessel was valued at \$27,000.

On August 1 the steamer *Ella* struck an unseen obstruction and was beached. The hull became a total loss. Property loss \$12,000.

On August 16 the steamer *Alice* struck a rock in Wrangell Narrows and sank. Was raised and temporary repairs made.

On October 16 the motor vessel *Iowa* grounded on Chilkat Island, Alaska. Estimated damage \$300.

1908.—On March 20 the steamer *Saratoga* grounded on a reef near Ellamar, Alaska, and became a total loss. Value of vessel \$150,000. Value of cargo \$28,000.

On April 16 the steamer *Tyee Junior* struck an uncharted rock. Damage estimated at \$1,000.

1909.—On April 30 the steamship *Columbia* stranded on Unimak Island, Alaska. Property loss estimated at \$75,000.

On July 14 the steamship *Ohio*, from Seattle to Alaskan ports, struck an uncharted rock in Tongass Narrows. The charts showed no soundings where she struck under 30 fathoms (180 feet). Note that it was in the Narrows where this vessel struck that 14 pinnacle rocks have been found this year which were hitherto unknown.

On September 13 the steamer *Uyak* struck on Walcott reef, Uyak Bay, western Alaska, and became a total wreck. Estimated value of vessel \$5,000.

1910.—On January 5 the steamer *Farallon* stranded on a reef in Iliamna Bay, Alaska, and became a total loss. Property loss \$40,000.

On April 11 the steamer *Georgia* stranded on an uncharted reef near Goose Island, Icy Straits, Alaska. Amount of damage \$1,050.

On November 12 the steamship *Portland* struck on or near Martin Islands, Katalla Bay, Alaska, and was a total loss. Estimated property loss \$75,000.

On December 10 the steamship *Olympia* stranded on Seal Island Reef, Alaska, and became a total loss. Loss \$120,000.

1911.—On October 7 the steamship *Edith* ran aground on the shoals off Level Island, Alaska, and was later floated. Damage \$25,000.

On December 13 the steamer *Zapora* stranded on Nesbitt Reef, Zarembo Island, Alaska, and was floated the same day. Damage \$7,000.

1912.—On May 20 the lighthouse tender *Armeria* struck on the rocks and was lost. Estimated property loss \$175,000.

On August 13 the steamship *Mariposa*, from Alaska ports to Seattle, struck an uncharted rock off Point Baker, in Sumner Straits, just west of where the chart shows 111 fathoms (666 feet)

1913.—On June 11 the steamer *Yukon* ran aground on reefs off Point Pitro, Sannak Island, Alaska.

On June 21 the steamer *Curacao* ran aground at Warm Chuck, west coast of Prince of Wales Island, and was a total loss. Property loss \$200,000.

On August 17 the steamer *State of California* struck an uncharted rock in Gambier Bay where charts show $12\frac{1}{2}$ fathoms (75 feet) and became a total loss; 31 lives lost. Estimated property loss \$350,000.

On August 26 the steamer *Kayak* was wrecked off Ocean Cape, Yakutat, Alaska. Damage \$12,000.

On December 26 the steamer *Delhi* stranded. Damage about \$5,000.

The record for 1914 is incomplete but it contains the *Tahoma*, as above, and on October 5 the Steamboat-Inspection Service advised me as follows:

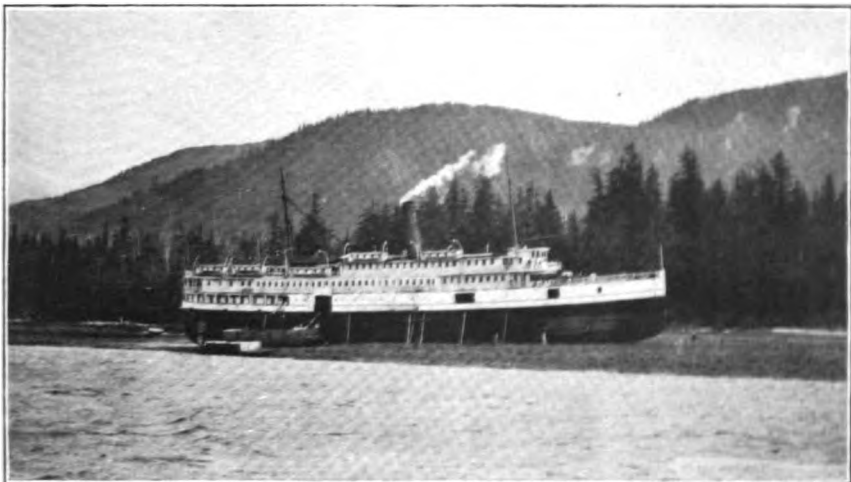
The Bureau is this day in receipt of report from the local inspectors at Juneau, Alaska, to the effect that on the morning of September 4, 1914, the steamer *Redondo*, while running up the unnamed bay on the western shore of Shuyak Island, east of Eagle Cape, at low tide, struck an uncharted rock near the middle of the bay, over which there was 6 feet of water at low tide. Soundings gave depths of 3 fathoms amidships and 4 fathoms astern. After remaining on the rock half an hour, the vessel was backed off with the rising tide, and made no water, and was put on the beach on September 7, where examination showed considerable damage to the bottom, extent of which has not yet been determined.

The photographs of 7 wrecks in Alaska, which are shown opposite this page, illustrate pictorially the dangers of Alaskan waters.

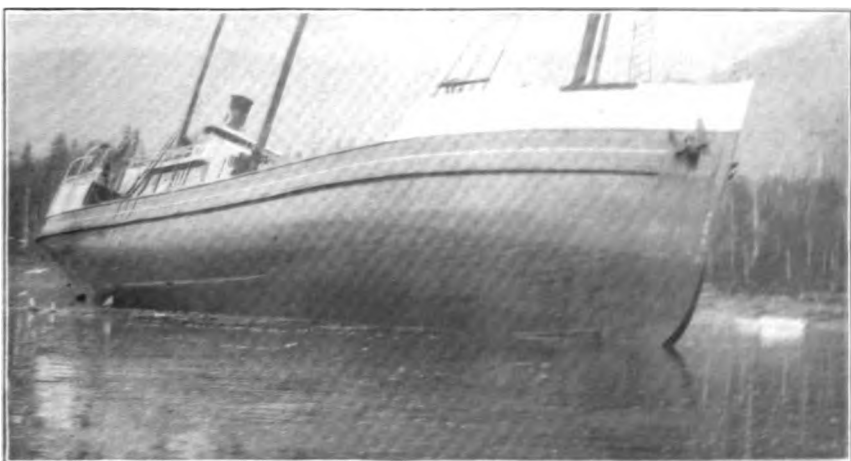
The records given above establish beyond all doubt the fact that many marine disasters, some attended by loss of life, have occurred on the coast of Alaska because the Government has failed to properly safeguard its commerce in those waters by adequate surveys and accurate soundings. In order to do three months' wire-drag work we will have to lay up steamers whose surveying work is urgently needed. The shortage of funds is such that both these necessary operations can not be carried on together. If one is done, the other to that extent must be left undone until Congress shall provide further funds.

Economical Use of Inadequate Funds.

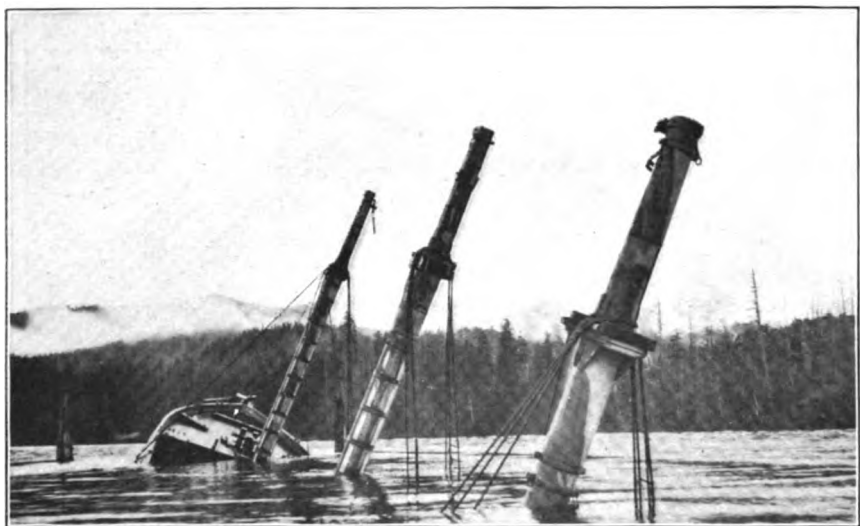
Here may be raised a question as to the wise use by the Coast and Geodetic Survey of such funds as are appropriated for it. That there may be no doubt about the subject a schedule is appended of the use of these funds during the fiscal years ending June 30, 1913, and June 30, 1914, together with the proposed allotment for the use of the funds for the current fiscal year:



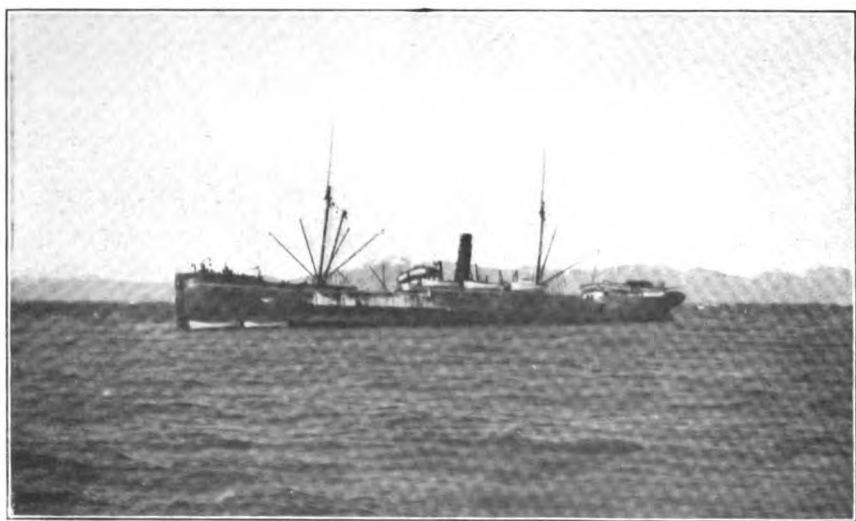
STEAMER "CITY OF SEATTLE," BEACHED IN EAGLE RIVER HARBOR, NEAR KETCHIKAN, ALASKA, AFTER HAVING STRUCK AN UNCHARTED ROCK.



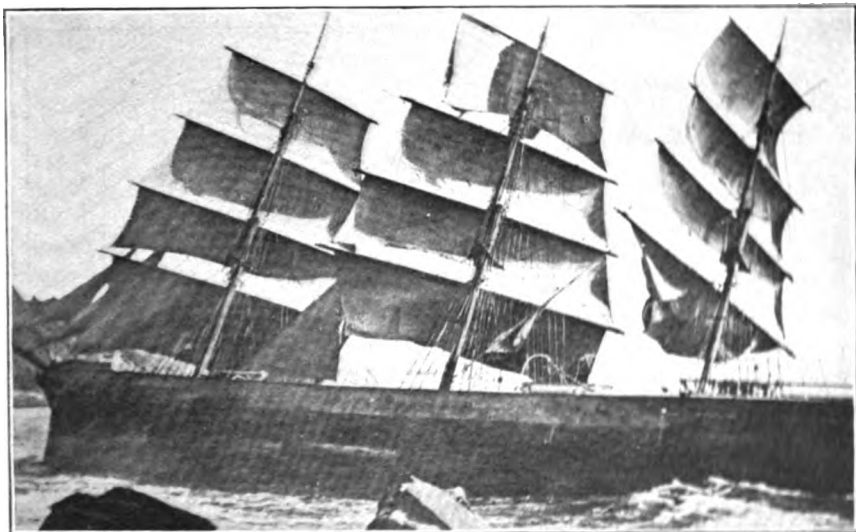
STEAMER "THOMAS L. WARD" ASHORE AT KETCHIKAN, ALASKA



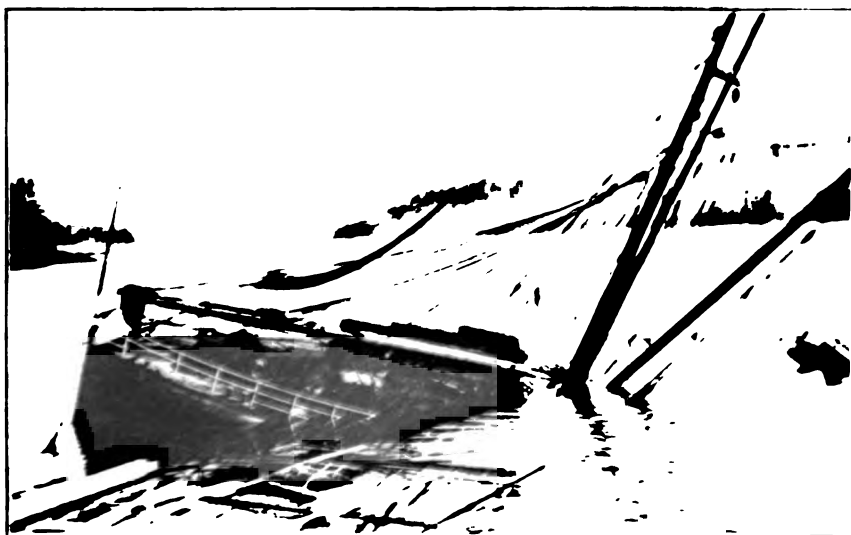
"CHARGER," AGROUND IN KARTA BAY, PRINCE OF WALES ISLAND, ALASKA.



STEAMER "OLYMPIA" STRANDED ON BLIGH ISLAND REEF, ALASKA.



"GLENESLIN." ON THE ROCKS NEAR NEAH-KAR-NIE MOUNTAIN, ALASKA.



"HOORACAO" AGROUND AT WARM BAY, WEST COAST OF PRINCE OF WALES ISLAND, ALASKA.



STEAMER "MARIECHEN," AGROUND IN FALSE BAY, ALASKA.

AMOUNTS EXPENDED UNDER THE APPROPRIATION, "PARTY EXPENSES," SUB-ITEM "PACIFIC COAST," FOR THE FISCAL YEARS 1913 AND 1914; ALSO THE AMOUNTS EXPENDED UNDER THE APPROPRIATION, "PARTY EXPENSES," SUB-ITEM "PACIFIC COAST," WITHOUT YEAR; ALSO AN ESTIMATE OF THE DISTRIBUTION OF THE APPROPRIATION, "PARTY EXPENSES," SUB-ITEM "PACIFIC COAST," 1915, INCLUDING THE ESTIMATED BALANCE UNDER WITHOUT YEAR.

Party.	Nature of work.	Expended, 1913.	Expended, 1914.	Distribution of appropriation for 1915, including estimated balance under without year.
ALASKA.				
Steamer Explorer.....	Combined operations.	\$20,361.51	\$9,923.20	Alaska, 7 months.. \$9,800 Outfit..... 2,000 Laid up, 5 months. 1,200 \$13,000
Steamer Gedney.....	.....do.....	6,791.41	7,658.15	Alaska, 7 months.. 4,700 Outfit..... 1,500 Laid up, 5 months. 1,000 7,200
Steamer McArthur.....	.....do.....	11,010.55	8,366.29	Alaska, 7 months.. 4,700 Outfit..... 1,500 Laid up, 5 months. 1,000 7,200
Steamer Patterson.....	.....do.....	18,580.78	24,984.48	Alaska, 5 months.. 14,700 Outfit..... 2,000 Laid up, 7 months. 2,000 18,700
Steamer Taku.....	.....do.....	6,209.75	6,217.82	Alaska, 7 months..... 5,000
Steamer Yukon.....	.....do.....	6,383.95	8,290.47	Alaska, 4 months..... 5,200
R. P. Strough.....	Triangulation.....		606.02	
J. A. Daniels.....	Wire-drag hydrography.		6,590.23	Alaska..... 15,000
PHILIPPINE ISLANDS.				
Steamer Pathfinder....	Combined operations.	20,350.43	23,725.00	Philippine Islands..... 23,000
Director of Coast Surveys.	Combined operations, inspection, etc.	64,502.07	62,606.00	.....do..... 62,000
HAWAIIAN ISLANDS.				
E. R. Hand.....	Chart revision.....	5,047.37	2,919.58	Hawaii, 6 months..... 2,700
PACIFIC COAST.				
San Francisco suboffice.	Inspection, etc....	982.88	1,012.54	..... 1,200
Seattle suboffice.....	.....do.....	1,473.62	1,762.72	..... 2,600
Fremont Morse.....	Chart revision.....		904.09	Shore party.....
J. W. Maupin.....	.....do.....		1,456.00	.....do..... 2,400
E. H. Pagenhart.....	Triangulation.....	1,983.23	6,430.99	.....do.....
G. T. Rude.....	.....do.....		411.00	.....do.....
H. A. Seran.....	.....do.....		6,299.50	.....do..... 4,800
Miscellaneous outfit.....		711.45	535.79	
Balance unallotted.....		611.00		
Total.....		165,000.00	180,699.87	170,000

**DISTRIBUTION OF ALL AVAILABLE FUNDS FOR THE SURVEYS OF THE ENTIRE
PACIFIC COAST, ARRANGED UNDER PROJECTS.**

Locality.	Party ex- penses.	Tides.	Off- shore work.	State sur- veys.	Special surveys.	Objects not named.	Repairs of vessels.	Pay of officers and men.	Sal- aries, field.	Total.
Alaska.....	\$71,300	\$185	.....	\$2,755	.....	.....	\$23,000	\$119,200	\$36,200	\$251,640
Philippines...	85,000	.....	\$2,280	.....	.....	.....	5,000	55,000	26,000	173,280
Hawaii.....	2,700	.....	.....	3,500	.....	.....	.....	.....	3,500	9,700
Pacific coast..	11,000	800	.....	.....	\$3,500	\$630	2,000	8,000	12,500	38,430
Total.....	170,000	985	2,280	6,255	3,500	630	30,000	182,200	76,200	474,030

The sundry civil act provides \$165,000 for surveys in Pacific waters during the current fiscal year, and a further sum of \$5,000 is available from an old continuing appropriation, making a total of \$170,000. The Superintendent of the Coast and Geodetic Survey states, respecting the provision of \$15,000 in the above schedule for a wire-drag party:

To keep it in the field for a greater period would be at the sacrifice of laying up all of the steamers during the spring season of the year, which would involve not only the loss of this valuable time, but also the expense during the time that the vessels were idle, which would be considerable and without any results.

It must now be considered whether any portion of the above fund of \$170,000 used under the technical heading "Party expenses, Pacific coast," which includes the operations of the steamers, can be transferred from its present use so that a larger amount can be spent in Alaska. First of all it should be said concerning this that if the entire amount were available for Alaskan work alone it would require many years to bring the original surveys to a close, for the coast line of Alaska is greater than that of the Atlantic, Pacific, and Gulf coasts combined and far more dangerous. We have never as yet sized up the job properly. We have gone at the matter on a scale as futile as the poor woman's attempt to sweep back the Atlantic with a broom. We put thirty millions into a railway to develop a growing national possession from which we have drawn hundreds of millions in value without providing the ordinary apparatus required to make surveys to insure safety in waters known to be dangerous by their continuing terrible record.

Can we, however, withdraw out of the \$170,000 that is available for the entire Pacific work some funds from their present uses and apply them to Alaska?

The only considerable item other than Alaskan work in the above schedule is that for the surveys in the Philippine Islands.

Should any part of this be transferred from use there and spent upon Alaska? Following a suggestion to this effect the Department has very carefully considered the subject. It was first studied whether the steamer *Pathfinder*, now operating in the Philippines, could be transferred to Alaskan waters. This is impracticable because—

First. The joint agreement between the Governments of the United States and the Philippine Islands, entered into with the approval of the Secretary of the Treasury, provided for—

The United States to maintain at least one of its large surveying vessels in the Philippine Islands and to pay the entire running expenses of this vessel.

The Philippine government has not only adhered strictly to its side of the agreement but has added 25 per cent to its stipulated contribution to the expenses of the surveys.

Second. The *Pathfinder* is the only available vessel for the work on the northeast coast of Luzon, where the work has to be done during the typhoon season, as the heavy sea along this coast during the northeast monsoon makes work at that season impracticable. This coast is almost uninhabited, except by wild tribes; harbors, of which little is known, are few, long distances apart, and impracticable of entrance during the thick weather which accompanies typhoons. A vessel for this work must be capable of putting to sea and weathering a typhoon if necessary. She must have large capacity for coal, oil, water, and general stores, as there are no sources of supply at hand. The *Pathfinder* alone of our fleet in those waters has these qualifications.

Third. The *Pathfinder* is the only vessel at our disposal adapted for service in other exposed regions distant from a base of supplies, or when the conditions are not sufficiently peaceful to warrant sending one of the smaller vessels.

Fourth. Since it would be impossible to ship a crew of Americans in the islands, the cost of bringing the vessel to the Pacific coast would have to include the return transportation of the Philippine crew to the islands. The American crew required on the American coast would add about \$14,400 and increased cost of coal about \$4,800 per annum to her operating expenses, or \$19,200 from our already inadequate appropriation for the Pacific coast work.

Pursuing the subject further, the Superintendent of the Coast and Geodetic Survey was asked whether \$30,000 could be transferred from the general fund allotted to the prosecution of the work in the Philippine Islands for the purpose of permitting

wire-drag surveys in Alaska. In response, the Superintendent submitted the following statement:

All the great nations are engaged in maritime surveys not only in their own countries but in foreign parts where the local governments do not carry on surveys or in ocean areas where there are no accurate surveys.

It is recognized that making maritime surveys is a duty which all civilized nations owe to the safety of life and property engaged in the world's commerce.

In accordance with the joint agreement between this and the Philippine government that the Survey should maintain one of its larger vessels in the Philippines, paying all its expenses, and as the only Survey vessel in the Philippines is the *Pathfinder*, it can not in good faith be withdrawn from there.

The withdrawal of \$30,000 can therefore only be accomplished by laying up the two steamers *Romblon* and *Marinduque*.

The following figures showing the result of such action are based on the actual expenditures for the fiscal year 1913, the only complete figures available for expenditures of the Philippine government:

	Paid by United States: Party ex- penses.	Paid by Philippine Islands: Pay of crew, rations, clothing, repairs, etc.
Steamer <i>Romblon</i> accounts.....	\$14,856	\$12,685
Steamer <i>Marinduque</i> accounts.....	12,571	16,937
Amount paid by the Washington office and chargeable against party expenses for these two vessels.....	1,072	.....
Reduction on account of less funds being required for traveling expenses for officers and employees between the United States and the Philippine Islands....	1,130	.....
Total reduction account party expenses.....	29,629	29,622

The withdrawal of two of the five vessels employed in the Philippines would reduce the output 40 per cent.

It is evident that the withdrawal of \$30,000 by the United States would necessarily result in the withdrawal of an equal amount by the Philippine government, so that the progress of the survey in the Philippines would be hampered by a loss of \$60,000 now available for field work without any reduction in that portion of the overhead charges now borne by the United States.

Owing to the rapid progress that has been made in the surveys of the Philippines and the general satisfaction over the results that have been obtained to date, the importance of rapidly continuing the work in the unsurveyed regions of this locality should not be overlooked. The entire region off the north coast of Luzon, including the Babuyan Islands, Balintang Channel, the Batan Islands and Bashi Channel and thence across to Formosa remains imperfectly surveyed and is considered dangerous to navigation. By far the greater number of vessels that sail between the west coast of the United States and from Japan to the Philippines pass through this region. The entire locality about the island of Palawan and the Calamianes is very dangerous to navigation, while the existing charts are the results of only reconnoissance surveys and can not be safely used. The entire Sulu Sea requires careful surveying, as it is well known that numerous dangers to navigation exist, none of which have been located with sufficient accuracy to make navigation safe, while without doubt many dangers exist which have not been found. The entire region about Palawan and certain sections of the Sulu Sea is so dangerous that its navigation is forbidden by the underwriters, thus making it necessary for vessels navigating between southern island ports and Singapore en route to the Suez or to the west coast of Borneo and Sumatra to travel hundreds of miles from the most direct course which could be utilized if

properly charted. The approximate distances lost on this account are from Iloilo 200 miles, from Cebu 210 miles, and from Zamboanga 400 miles.

The following statistics are copied from the Report of the Philippine Commission for the year 1913:

"Total value of the foreign commerce, \$110,010,859.

"During the fiscal year 1913 there entered the Philippine Islands from foreign ports 794 vessels with a total tonnage of 1,831,212 tons, and there were cleared for foreign ports 781 vessels, representing a total tonnage of 1,868,811 tons. If to the above are added the coastwise entrances and clearances which some of these vessels made at ports in the Philippine Islands other than their principal port of destination, the total is 2,456 vessels, representing 5,073,533 tons."

In conclusion, I beg leave to state that a reduction of approximately \$30,000 in the allotment that has been available for the Philippine Islands would not only involve a loss in efficiency, the value of which is many times more than the amount involved, but there would be a real financial loss of many thousands of dollars due to the fact that much of the fund provided by the Philippine government would not be utilized and to the fact that overhead costs would practically remain unchanged.

It will be clear from the above that the local interests of the Philippines, the safety of our own national vessels, and our international obligations all require that the work in the Philippines shall not be interrupted and that the valuable cooperation of the Philippine government in it shall not be lost. The appropriation made by that government this year was secured with some difficulty because of the necessity on their part of reducing expenses, and was, by implication, conditioned upon the continuance of our own work on an undiminished scale. Since for lack of surveys vessels between Europe and Iloilo lose 200 miles distance, between Europe and Cebu 210 miles distance, and as regards Zamboanga 400 miles distance, the completion of the surveys would move the latter port $1\frac{1}{2}$ days nearer Europe for freight vessels and would bring the two former ones each almost a day nearer their markets. We should be justly accountable to the maritime world if we withdrew from the Philippine surveys while the entire region of the north coast of Luzon and thence across to Formosa, being the main route of travel from the north and east not only to the Philippine Islands but into the China Sea, remains imperfectly surveyed and is considered dangerous.

The Secretary of War wrote me as follows November 12, 1913

For several years the government of the Philippine Islands has been appropriating approximately \$100,000 a year for the work of the coast survey of the islands.

This work has been carried on in an entirely satisfactory manner by the United States Coast and Geodetic Survey. In fact, the entire work mapped out is nearly 70 per cent concluded. It would be a misfortune if the work could not be carried on to a successful conclusion. On the other hand, it is almost impossible for the Philippine government to continue at this time to make this appropriation of \$100,000 a year.

Similar work in other dependencies is carried on by the United States without assistance from the governments thereof. In 1906 this matter was taken up and it was

then believed that it would be well for the United States to increase the appropriations for the Coast and Geodetic Survey so that the Survey might take over the entire expense of this work.

I hope that you can have the necessary amount included in your estimates for the approaching fiscal year. It would be a great accommodation to the Philippine government, as without suspending a very necessary work it would enable that government to make certain retrenchments which are absolutely necessary, without a bond issue, which it is at present hoped to avoid.

To this I replied November 17, 1913, as follows:

I have given careful attention to your kind favor of the 12th in the matter of the coast survey of the Philippine Islands. The subject has been taken up by me personally with Dr. O. H. Tittmann, Director of the Coast and Geodetic Survey, and as a result of such conference I beg to advise you as follows:

The Coast and Geodetic Survey is spending each year for service in the Philippine Islands approximately the sum of \$180,000 out of its own fund in addition to the appropriation from the Philippine government. I regret that it is impossible for us either to exceed that expenditure on our present appropriation or to ask for an increased appropriation for this purpose. This is because the circumstances of the work of the Coast and Geodetic Survey are such that our estimates for the fiscal year 1915 already show an increase over the fiscal year 1914 of \$728,240, or about 70 per cent. This arises in large part from the urgent need for additional vessels to complete the work on the coast of Alaska. This particular need is reinforced by the recent loss of three important vessels on that coast from uncharted dangers, viz, the *Armeria*, the *Curacao*, and the *State of California*, the latter with the loss of 31 lives.

Under these circumstances, while the Coast Survey will continue its present expenditure in the Philippines, the situation in those islands would be greatly changed if the Philippine government fails to add to the share it has heretofore granted. It will mean the withdrawing from service of three out of the five vessels now employed in the survey and the discontinuance of the geographic office in Manila, in which work I am told your office is especially interested. This would mean that the survey which might take 10 years normally to complete would undoubtedly be extended for 20 years or more. The condition would be the more grave since the waters requiring to be surveyed are the field of a considerable and an increasing amount of international commerce.

I earnestly hope, therefore, that it may be possible for the Philippine government to continue its appropriation so that the full force heretofore so successfully employed, and very largely of Filipinos, may continue in service.

The Philippine government made this appropriation and the work was continued. In this connection the War Department and the Navy Department have been recently consulted, since both are directly interested in the prosecution of the Philippine coast surveys, for they affect not only the safety of the local maritime commerce of the islands but the security of our transports and our vessels of war. They advise me as follows:

WAR DEPARTMENT,

Washington; October 5, 1914.

MY DEAR MR. SECRETARY: You have asked me if we can wisely and safely curtail the operations of the Coast and Geodetic Survey in the Philippine Islands by reason of the urgent demand for work in Alaska and, while I was prepared to answer immediately that I did not feel that the work of the Coast and Geodetic Survey in the Philippine Islands should be suspended or slackened, I thought it best to examine the

records with reference to this work and to give a more accurate statement than I could from memory.

It is needless to review the several reports which have been made of this work in the Philippine Islands further than to say that such reports show that the work has been uniformly commended by the Philippine authorities. The last report of progress now at hand shows that at the close of the fiscal year 1913 sixty-three per cent of the entire general coast line of the islands had been surveyed and that about 5.2 per cent represented the work accomplished in that year.

The cost of this work is borne in part by the Philippine government and in part by the United States Government. In that year, for example, the Philippine government expended slightly over ₱200,000.

In so much as the Coast and Geodetic Survey work is elsewhere carried on exclusively at the cost of the Federal Government, it has been hoped at times that the Federal Government would take over the entire cost of this work. It has not been possible to have this done, and the appreciation of the work by the Philippine government is shown by the continued appropriations therefor, even when the revenues of that government were falling below the expenses of the government. In the appropriation bill for the current calendar year in the Philippine Islands, while every effort was made to curtail expenses, there was the usual appropriation for the Coast and Geodetic Survey. It is believed that this action on the part of the government of the islands is the best evidence of the urgent need of this work in the islands.

While the interest of the Philippine government is largely due to the benefits of this work to commerce and the development of the islands, the work has been of great benefit to the Navy and in this Department to the transport service of the Quartermaster's Corps of the Army.

It is needless to add that any curtailment of the work or any suspension would simply mean a greatly increased cost for the completion of the work.

Very sincerely,

LINDLEY M. GARRISON,
Secretary of War.

The Honorable the SECRETARY OF COMMERCE.

THE SECRETARY OF THE NAVY,
Washington, October 8, 1914.

DEAR MR. SECRETARY: Replying to your inquiry as to the advisability of continuing to completion the hydrographic survey of Alaskan, Hawaiian, and Philippine waters, it is unquestionable, and the work should be completed for the safety of navigation.

In the Philippines, naval operations have been embarrassed because of the lack of complete survey, and vessels have grounded owing to the lack of sufficient surveys.

Sincerely,

JOSEPHUS DANIELS.

HON. WM. C. REDFIELD,
Secretary of Commerce, Washington, D. C.

The following statement from The New York Evening Post of October 17, 1914, reinforces the statement of the Secretary of the Navy quoted above:

Months of unremitting effort and unflagging patience have been rewarded finally by salvage of the gunboat *Princeton*, which, while returning from a surveying expedition to her berth in Pago Pago Harbor, American Samoa, ran full speed onto an uncharted rock, within gunshot of shore. Engineers had only the most primitive appliances to save the ship. Divers first covered the gaping rents in the *Princeton's* hull with canvas. By keeping their pumps working at top force, they were then able to make headway enough against the water to place plank sheathing. To top

their achievement, they separated a pinnacle of rock, which had pierced the *Princeton's* bottom, from the ledge of which it was a part, cemented it fast in the wound it had jabbed, and left it sticking there like a shark's tooth, torn from the jawbone of the ledge.

The Department is therefore forced to the conclusion that the work in the Philippine Islands is itself of such a character that it can not be safely interrupted or left undone at this time and that no funds can be withdrawn from its prosecution. Under these circumstances it will ask Congress for a sufficient further sum to permit keeping its vessels in operation throughout the year, to provide for the early building of new ships to take the place of the three which are antiquated and dangerous, and for the use of a wire-drag apparatus in Alaskan waters throughout the short season incident to that territory. It earnestly hopes that the cogent reasons that have been given will lead to the providing of the necessary funds. This will call for an increase of the appropriation for Pacific waters of from \$165,000 to \$225,000 and for an appropriation of \$500,000 for the construction of vessels.

The question was asked at a recent hearing before the Appropriations Committee of the House of Representatives on the estimates for the Coast and Geodetic Survey when its work would be completed. The answer must be that the work of the Coast Survey will be done when the currents of the ocean cease to flow, when the rivers cease to deposit along their channels and to form bars at their mouths, and after the necessity for further river and harbor improvements shall have ceased. So long as nature keeps up her submarine processes, the work of the Coast and Geodetic Survey will never be done.

It is obvious also that the great increase in draft of commercial and naval vessels and the opening of new harbors make necessary a revision of the early surveys in many localities and the extension of the detailed hydrography to greater distances from the shore. In the course of revising the Coast Pilot during August, 1914, a rock dangerous to navigation with 9 feet of water over it was found in the upper Hudson River and marked.

It will require 25 years at the present rate of progress to complete the preliminary surveys in Alaska alone, and there would still remain a large but indeterminable number of detailed surveys necessary for full safety to navigation.

Geodetic Work.

I have thus far spoken only of the coast survey work. It remains to speak briefly of the geodetic work of the Survey. This

includes the fundamental precision surveys to which all boundaries and land measurements are referred. It fixes the relation of our coast lines to each other, and serves as the fundamental basis of all chart and map making. This highly practical branch of engineering is required by the following organizations of the Government which use it constantly: The Engineer Corps of the Army, the United States Geological Survey, the General Land Office, the Reclamation Service, the Forestry Bureau, the Bureau of Soils, the Topographic Division of the Post Office Department, the Drainage Investigation Division of the Agricultural Department, the Valuation Division of the Interstate Commerce Commission, the International Boundary Commission, and several bureaus of the War Department.

This work is also utilized by the State boundary surveys, highway commissions and drainage commissions, and largely by railroads, consulting engineers, surveyors, physicists, and astronomers. It is constantly scrutinized by parties interested all over the world, both as to its cost and method.

In France, Commandant Perrier says of our geodetic work:

There is no example in the history of geodesy of a comparable collection of measurements made with so much decision, such great rapidity and such powerful means of action and guided by such an exact comprehension of the end to be attained.

Petermann's Geographic Magazine, the most famous of its kind, published in Germany, reviewing in 1913 our work on a new arc, says:

Worthy of remark is the accuracy attained in the measurements * * * but not less noteworthy are the great rapidity of execution and finally the small costs. In both of these last particulars probably it is not excelled by triangulation in any other land. This volume is a further noteworthy example of the untiring energy with which in the United States surveying and geodesy are carried on.

At the conference of the Surveyors General of New Zealand and Australia, in 1912, a geodetic survey under a Federal organization was recommended, with the statement that it should be conducted "on similar lines to those adopted in the United States Coast Survey, and, taking the coast line first, should be gradually extended inland."

The Surveyor General of India says:

I must thank you for your interesting chart of triangulation which I received with your letter of the 22d November, 1912. It is certainly an extraordinary piece of work, we have no means of working here with such rapidity. I see that your observers completed 103 stations in 200 days, including 17 observed azimuths and 2 bases. I am circulating the chart to our observers.

In 1909 at the meeting of the International Geodetic Association held in Cambridge and London the Americans were congratulated on having introduced a new epoch in geodesy.

Dr. Woodward, a distinguished geodesist and president of the Carnegie Institution, in an address before the Philosophical Society of Washington said that the work done on isostasy by the chief of the computing division of the United States Coast and Geodetic Survey "is the greatest contribution to geodesy since the time of Bessel and Gauss."

During July, 1914, 120 miles of precise leveling were completed on the line between Butte, Mont., and Pasco, Wash. The running of 120 miles of completed work constitutes a world record. The previous record, also established in this country, was 112 miles for one calendar month, and was made about eight years ago.

It is not easy to obtain the cost of work of this kind in foreign countries. We find, however, in the report of the Trigonometric Survey of India that one leveling party composed of 35 persons makes progress at the rate of 52 miles per month. In our Coast and Geodetic Survey one party of 6 men averages about 79 miles per month. The cost of precise leveling by other branches of this Government given by a standard work on surveying (1910) states the cost at from \$15 to \$32 per mile. It also gives the cost of French leveling at \$10 per mile and German at \$9.50 per mile. I present tables showing in detail, graphically and in figures, the steady increase in the efficiency of our geodetic work, as well as a condensed statement of the problem of the geodetic work required in the United States.

GEODETIC WORK—RATE OF PROGRESS FOR A SINGLE PARTY.

BASE MEASUREMENT.

Before 1899.....No exact data available.
1899 to 1909.....
1909 to present.....

19 days to 1 base.
15 days to 1 base.

PRIMARY TRIANGULATION.

Before 1899.....No exact data available; less than 20 miles per month.
1899 to 1909.....
1909 to present.....

47 miles per month.
63 miles per month.

PRECISE LEVELING.

Before 1899.....Less than 60 miles per month.
1899 to 1909.....
1909 to present.....

68 miles per month.
79 miles per month.

LONGITUDE.

Before 1899.....No exact data available; less progress than since 1899.
1899 to 1909.....
1909 to present.....

2.3 differences per month.
2.2 differences per month.

LATITUDE.

Before 1899.....No exact data available.
1899 to 1909.....
1909 to present.....

4 stations per month.
8 stations per month.

GRAVITY.

Before 1899.....No exact data available.
1899 to 1909.....
1909 to present.....

2.9 stations per month.
4.0 stations per month.

GEODETIC WORK—AVERAGE COSTS.

BASE MEASUREMENT.

Before 1899.....No data available.

1899 to 1909.....

\$130 per kilometer.

1909 to present.....

\$80 per kilometer.

PRIMARY TRIANGULATION.

Before 1899.....

\$400 per mile.

1899 to 1909.....

\$66 per mile.

1909 to present.....

\$34 per mile.

PRECISE LEVELING.

Before 1899.....No exact data available, but more than \$16 per mile.

1899 to 1909.....

\$11 per mile.

1909 to present.....

\$11 per mile.

LONGITUDE.

Before 1899.....No data available.

1899 to 1909.....

\$435 per station.

1909 to present.....

\$462 per station.

LATITUDE.

Before 1899.....No data available.

1899 to 1909.....

\$170 per station.

1909 to present.....

\$125 per station.

GRAVITY.

Before 1899.....No data available.

1899 to 1909.....

\$325 per station.

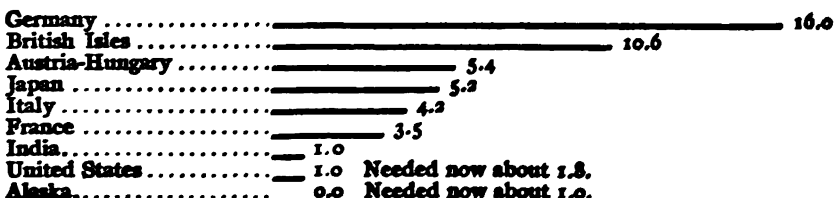
1909 to present.....

\$245 per station.

PRIMARY TRIANGULATION AND PRECISE LEVELING IN A NUMBER OF COUNTRIES.

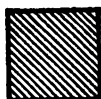
Country.	Total area.	Per cent of area covered by primary triangulation.	Miles of precise leveling.	Miles of precise leveling per 100 square miles of area.
	<i>Sq. miles.</i>			
United States.....	3,970,000	12	31,000	1.0
Alaska.....	591,000	00	20	.0
British Isles.....	101,000	100	12,804	10.6
Austria-Hungary.....	241,000	70	13,129	5.4
France.....	207,000	40	7,284	3.5
Germany.....	209,000	83	33,631	16.0
Italy.....	111,000	100	4,603	4.2
Japan.....	176,000	100	9,129	5.2
India.....	1,767,000	33	17,901	1.0

PRECISE LEVELS—DIAGRAM SHOWING THE NUMBER OF MILES OF PRECISE LEVELING PER 100 SQUARE MILES OF AREA FOR A NUMBER OF COUNTRIES.

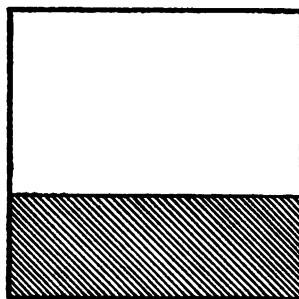


PRIMARY TRIANGULATION DIAGRAM SHOWING PERCENTAGE OF THE AREA, OF A NUMBER OF COUNTRIES, WHICH IS COVERED BY PRIMARY TRIANGULATION.

[Scale: $\frac{1}{4}$ inch square = 48,500 square miles.]



Japan, 100 per cent.



India, 35 per cent.



Germany, 83 per cent.



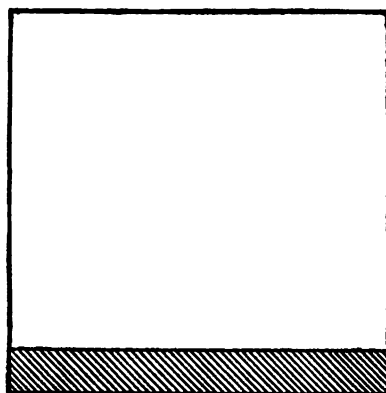
Italy, 100 per cent.



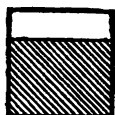
France, 40 per cent.



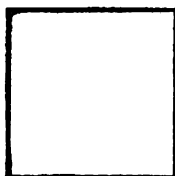
Great Britain, 100 per cent.



United States, 12 per cent.



Austria, 70 per cent.

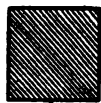


Alaska, 0 per cent.

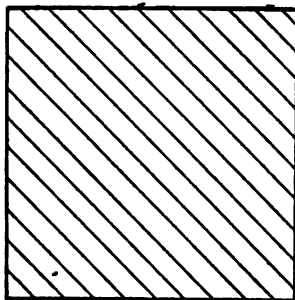
About 15 per cent should be done in the near future.

Between 20 and 25 per cent of the area should be covered as soon as possible to meet urgent needs.

PRECISE LEVELING DIAGRAM SHOWING, BY SHADING, THE NUMBER OF MILES OF
PRECISE LEVELING PER 100 SQUARE MILES FOR A NUMBER OF COUNTRIES.



Japan, 5.2.



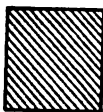
India, 1.



Italy, 4.2.



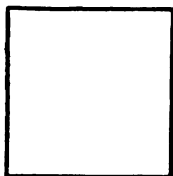
Germany, 16.



France, 3.5.

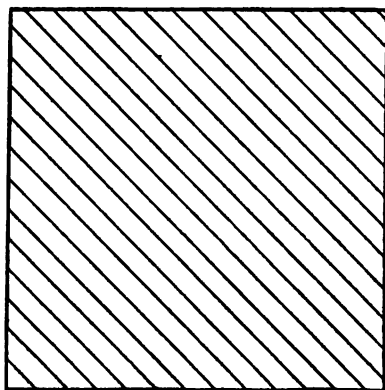
Great Brit-
ain, 10.6.

Austria, 5.4.



Alaska, 0.

Several thousand
miles are needed
now.



United States, 1.

The amount in the United States should
be increased to about 1.8 miles per hun-
dred square miles as soon as possible to
meet urgent needs.

There are about 12,000 linear miles of primary triangulation in the United States. There should be added within a few years 9,000 miles more.

About 19,000 miles more of precise leveling should be done in this country for immediate use.

At the present rate of appropriation for geodetic work it would require over 30 years to do the above work.

The geodetic work done in this and in other countries is shown in the accompanying diagrams on pages 160 and 161.

There follows a statement of the estimates of this service from 1904 to 1915, inclusive, and the appropriations from 1903 to 1915, inclusive.

STATEMENT OF ESTIMATES FROM 1904 TO 1915, INCLUSIVE, AND APPROPRIATIONS FROM 1903 TO 1915, INCLUSIVE, OF THE UNITED STATES COAST AND GEODETIC SURVEY.

Fiscal year.	Total for all purposes.	"Party expenses, Coast and Geodetic Survey."							
		Total.	Atlantic coast.	Pacific coast.	Physical hydrography.	Off-shore soundings.	Magnetic and geodetic observations.	Special survey for light-houses, etc.	Other objects.
APPROPRIATIONS.									
1903.....	\$828,525	\$264,900	\$70,000	\$107,500	\$5,000	\$15,000	\$50,000	\$13,400	\$4,000
1904.....	973,528	264,900	70,000	107,500	7,400	15,000	50,000	12,000	4,000
1905.....	849,625	264,900	70,000	107,500	6,400	15,000	50,000	12,000	4,000
1906.....	876,975	264,900	70,000	107,500	6,400	15,000	50,000	12,000	4,000
1907.....	848,915	257,900	70,000	107,500	6,400	15,000	50,000	5,000	4,000
1908.....	991,290	320,400	70,000	150,000	6,400	15,000	50,000	25,000	4,000
1909.....	996,290	325,400	70,000	160,000	6,400	15,000	50,000	20,000	4,000
1910.....	997,290	326,400	70,000	160,000	7,400	15,000	50,000	20,000	4,000
1911.....	996,790	320,400	70,000	160,000	6,400	15,000	50,000	15,000	4,000
1912.....	1,005,120	317,400	70,000	160,000	6,400	15,000	50,000	13,000	3,000
1913.....	1,022,720	314,400	65,000	165,000	6,400	15,000	50,000	10,000	3,000
1914 ^a	1,021,920	320,400	65,000	165,000	6,400	15,000	56,000	10,000	3,000
1915 ^b	1,045,720	320,400	65,000	165,000	6,400	15,000	56,000	10,000	3,000
ESTIMATES.									
1904.....	972,325	264,900	70,000	107,500	6,400	15,000	50,000	12,000	4,000
1905.....	1,091,575	264,350	70,000	107,500	6,400	15,000	50,000	12,000	3,450
1906.....	858,575	264,900	70,000	107,500	6,400	15,000	50,000	12,000	4,000
1907.....	861,515	264,900	70,000	107,500	6,400	15,000	50,000	12,000	4,000
1908.....	1,134,365	399,250	70,000	227,500	6,400	15,000	50,000	26,350	4,000
1909.....	1,012,130	335,400	70,000	170,000	6,400	15,000	50,000	20,000	4,000
1910.....	996,290	325,400	70,000	160,000	6,400	15,000	50,000	20,000	4,000
1911.....	995,590	315,400	70,000	160,000	6,400	15,000	50,000	10,000	4,000
1912.....	1,041,800	340,400	70,000	160,000	6,400	15,000	75,000	10,000	4,000
1913.....	1,146,670	387,000	70,000	200,000	8,000	20,000	75,000	10,000	4,000
1914.....	1,191,895	412,000	89,000	200,000	8,000	20,000	81,000	10,000	4,000
1915 ^b	1,760,960	450,000	99,000	225,000	12,000	20,000	75,000	15,000	4,000

^a Special appropriations for the fiscal year 1914 not included in statement: Alterations to buildings, \$12,500; damages, \$25.

^b The estimates for 1915 also included \$18,600 for a lithographic press; \$2,400 for extension to lithographic building; and \$4,000 for a brick building for storage. The appropriations for 1915 embraced \$7,500 for rebuilding the lithographic and aluminum printing building, and \$5,000 for the erection of a one-story building.

STATEMENT OF ESTIMATES FROM 1904 TO 1915, INCLUSIVE, AND APPROPRIATIONS FROM 1903 TO 1915, INCLUSIVE, OF THE UNITED STATES COAST AND GEODETIC SURVEY—Continued.

Fiscal year.	Repairs and maintenance of vessels.	Pay, etc., officers and men, Coast Survey.	Salaries.	General expenses.	New vessels.	Publishing observations.
APPROPRIATIONS.						
1903	\$29,600	\$210,245	\$282,780	\$40,000	.....	\$1,000
1904	43,600	210,245	282,780	50,000	\$120,000	1,000
1905	29,600	210,245	293,580	50,000	.....	1,000
1906	54,600	210,245	297,250	50,000	.....	.....
1907	20,000	210,245	280,770	50,000	.....	.....
1908	40,000	245,000	335,890	50,000	.....	.....
1909	40,000	245,000	335,890	50,000	.....	.....
1910	40,000	245,000	335,890	50,000	.....	.....
1911	40,000	245,000	341,390	50,000	.....	.....
1912	40,000	245,000	352,780	50,000	.....	.....
1913	60,000	245,000	353,380	50,000	.....	.....
1914 ^a	40,000	252,200	359,380	50,000	.....	.....
1915 ^b	40,000	252,200	364,680	56,000	7,500	.....
ESTIMATES.						
1904	29,600	210,245	296,580	50,000	120,000	1,000
1905	29,600	210,245	300,180	56,200	250,000	1,000
1906	35,000	210,245	298,430	50,000	.....	.....
1907	30,000	210,245	306,370	50,000	.....	.....
1908	52,000	282,245	350,670	51,800	.....	.....
1909	40,000	245,000	341,730	50,000	.....	.....
1910	40,000	245,000	335,890	50,000	.....	.....
1911	40,000	245,000	345,190	50,000	.....	.....
1912	40,000	245,000	366,400	50,000	.....	.....
1913	40,000	275,000	389,670	55,000	.....	.....
1914	40,000	275,000	392,370	60,000	.....	.....
1915 ^b	40,000	275,000	385,760	56,000	525,000	.....

^a Special appropriations for the fiscal year 1914 not included in statement: Alterations to buildings, \$12,900 damages, \$25.

^b The estimates for 1915 also included \$12,600 for a lithographic press; \$1,400 for extension to lithographic building; and \$4,000 for a brick building for storage. The appropriations for 1915 embraced \$7,500 for rebuilding the lithographic and aluminum printing building, and \$5,000 for the erection of a one-story building.

It will be noticed that the last new steamer for this service was furnished 10 years ago.

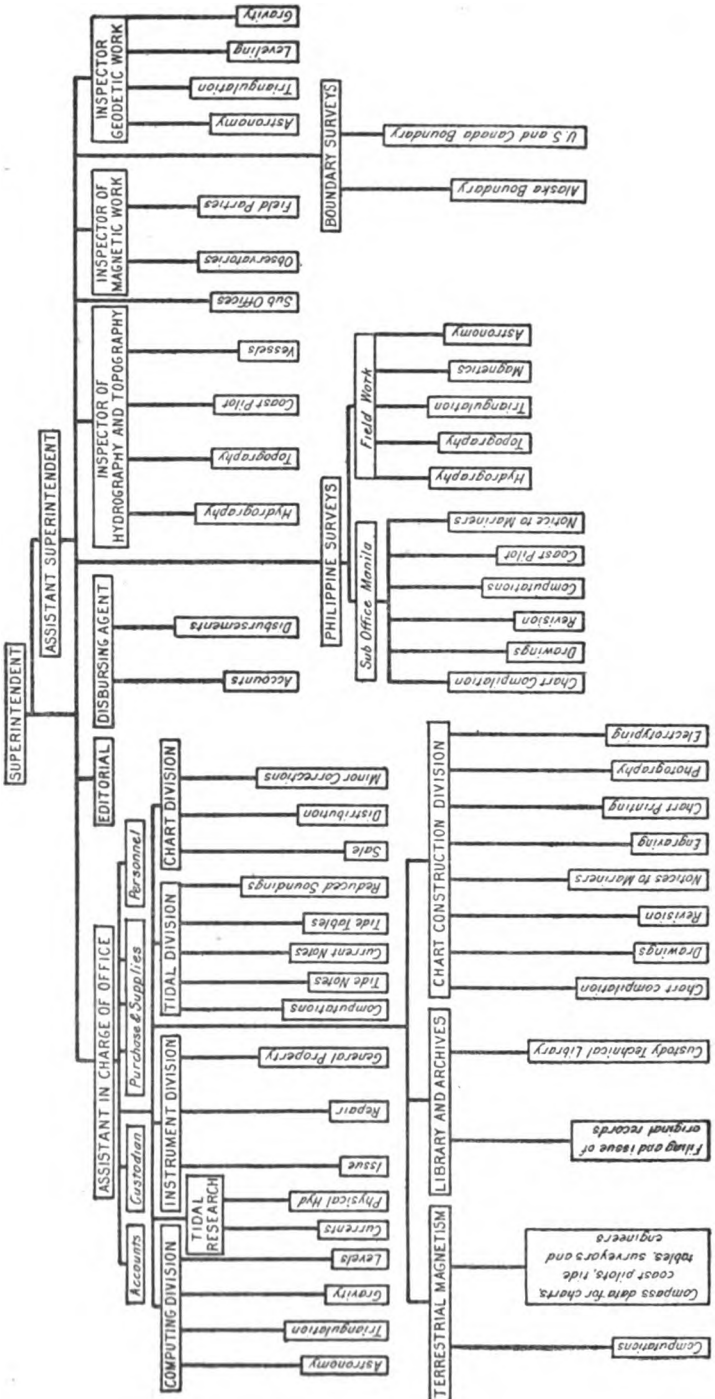
On page 164 is a chart showing the organization of the Coast and Geodetic Survey.

Changes in Washington Office.

It has been deemed best since the fiscal year closed to make certain administrative changes within the office of the Coast and Geodetic Survey in order to promote a higher efficiency in matters which are purely those of administration. It is my intention that

CHART SHOWING ORGANIZATION OF THE
COAST AND GEODETIC SURVEY

1914



in every respect this work shall measure up to the high standard of achievement which the Survey has reached on its scientific side. The serious matters which have been raised, however, are not affected by matters of local administration, important as these last may be. It is not an answer to our crying need for ships and apparatus to be told that an office needs readjustment. Whatever office readjustments are required will be made and those who point to a definite need of such readjustments do a public service, but it does not account for the omission to do a major thing to say that a minor thing is or is not left undone. Either the matters which are above stated are facts or they are not. If they are facts, they call for an instant remedy for the bad conditions shown. If they are not facts, those who assert them not to be facts should show it. For the Department let me say that I will welcome, nay desire, the most searching inquiry, with the single proviso that what is found shall be made public and shall be the basis for action.

It would be easy to give further details in illustration of the position first above taken that this, the most ancient and one of the most important of the scientific branches of the Government service, has not received equitable treatment in the past.

Miscellaneous Services Performed.

During the past year a proposition has been made to the Department by the Post Office Department that all the work of lithographing maps for that Department be turned over to the Coast and Geodetic Survey. While this arrangement would be highly desirable and advantageous to the Government it can not be undertaken until Congress has made provision for additional lithographic presses and other machinery for which an estimate will be submitted.

Dangers developed in the course of the work of the Coast and Geodetic Survey are promptly reported to the public in the Notices to Mariners issued as a joint publication by the Coast and Geodetic Survey and the Bureau of Lighthouses. The results of important surveys on the coast of Alaska are now furnished to the persons most interested in the form of transcripts from the original sheets in advance of the publication of charts.

The results of the geodetic, magnetic, and tidal work are furnished to the public in the form of special publications.

In cooperation with the Bureau of Fisheries, and in accordance with the plans of the permanent international branch for the

exploration of the sea, an oceanographic cruise was made by the steamer *Bache* in the Atlantic Ocean and Gulf Stream from the Chesapeake Bay to Bermuda and the West Indies. While the work was primarily suggested by the Bureau of Fisheries for obtaining information governing the fisheries on the coast of the United States, the results are of equal interest and value to the Coast and Geodetic Survey as affecting navigation.

In spite of adverse weather conditions important and interesting scientific results were obtained which will throw much light on biological and physical conditions in the Gulf Stream and the Western Atlantic.

Incidentally, important improvements were devised in the apparatus used in deep-sea sounding.

The Superintendent of the Survey is commissioner on the part of the United States for the survey and demarcation of the boundary lines between the United States and Canada. The expenses of this work are paid from a special appropriation under the State Department.

During the past year the important and difficult work of surveying and marking the boundary line on the one hundred and forty-first meridian and the irregular boundary to the southeastward of Mount St. Elias between Alaska and Canada has been completed so far as the field work is concerned and the resulting maps are now in course of completion. The work on the northern and northeastern boundary between the United States and Canada and Lake of the Woods and between Maine and New Brunswick has made good progress.

In response to an invitation of the Imperial German Government Congress, in 1889, authorized the adhesion of this Government to an international convention for the admeasurement of the earth and directed the President to send a delegate to the next meeting of said International Geodetic Association. (26 Stat., 1019.) The body organized under this convention is known as the International Geodetic Association.

Again, in July, 1894, the President of the United States was authorized to appoint delegates to attend the meetings of the International Geodetic Association whenever and wherever the association meets. (28 Stat., 587.)

The United States has been an adhering member since 1889, and it agreed under the terms of the convention to a continuation of its adhesion for certain decennial periods, the last of which will expire December 31, 1916.

One of the undertakings of the International Geodetic Association was the establishment and maintenance of the International Latitude Service, and two special observatories have been equipped and maintained in this country since 1898, one in Maryland and the other in California. The Coast and Geodetic Survey supervises the work of these observatories.

Out of the funds contributed by all the signatory powers the International Geodetic Association spends \$4,000 a year on these two American observatories, and it also allows a subvention to an observer at the University of Cincinnati. About three years ago it appropriated \$2,500 for the construction of a photographic zenith tube which was built in this country and installed at Gaithersburg, Md., with which results of very remarkable precision and great importance have been obtained, as will appear when the final report is published.

This year the Foreign Affairs Committee of the House provided, in the diplomatic and consular act, for the usual annual contribution of the United States, amounting to \$1,500, but the Appropriation Committee of the Senate, which has jurisdiction, struck out the item. The Secretary of State recommended that the item be restored, but it was not done. The United States has thus failed to appropriate money to pay the dues for which it stands pledged. It is a matter of national honor to make this annual contribution. We have agreed to pay it and can not fail to make the payment without repudiating a national obligation. Furthermore, a much larger sum than our contribution is annually spent in this country by the body to whom the contribution goes.

Aside from the fact that all the great powers of Europe are cooperating for the maintenance of the International Geodetic Association, the adherents in the Western Hemisphere are Argentina, Chile, and Mexico. Canada, through the adhesion of Great Britain, is also a member, and the United States stands pledged until December, 1916.

In the appropriations for the Coast and Geodetic Survey a small item (not to exceed \$550) has been carried for the attendance of delegates to the meetings of the association held every three years. The delegates are officers of the Coast and Geodetic Survey. This item also was stricken out of the appropriation act for 1915. The amount involved is trifling and its restoration has been requested.

Field Work of Surveying Parties and Vessels.

In the geodetic work 25 stations were occupied for the determination of latitude at stations on the one hundred and fourth meridian by one party in two and one-half months. The points occupied were stations of the arc of primary triangulation along that meridian which had been established in previous years. The party engaged on this work used an automobile truck as a means of transportation and it is due to this chiefly that such rapid progress was made. A series of latitude observations was begun along the Texas-California arc of primary triangulation from the vicinity of Barstow, Tex., westward.

A reconnoissance for primary triangulation was completed for an arc of primary triangulation which will extend from the vicinity of the Salt Lake base northward to the Canadian boundary, a distance of 555 miles. Rapid progress was made in this work, the time occupied being only two months.

A reconnoissance was made for primary triangulation between Little Rock, Ark., through Oklahoma, to the ninety-eighth meridian. Lines of precise leveling were extended from Butte, Mont., to the Canadian border and from Crookston, Minn., to Bertholdt, N. Dak. This work was done with unusual rapidity, one party completing 100 and 101 miles and the other 99 and 105 miles run backward and forward in two months. The previous record had been about 70 miles per month. The use of motor velocipede cars in this work had much to do with the rapid progress made.

The difficult triangulation between the tertiary work in Oregon southwest to a junction with the tertiary triangulation in the vicinity of Redding Rock, Cal., was completed.

The triangulation along the coast of Washington between Grays Harbor and the Strait of Fuca was begun. This portion of the State had not previously had any geodetic control.

The important work of determining telegraphic difference of longitude to connect the Naval Observatory, Washington, D. C., and the Cambridge, Mass., Observatory, with a point near Far Rockaway, Long Island, N. Y., which place was to be connected by observers of the Prussian Royal Geodetic Institute with Borkum, Germany, by cable, was begun before the close of the fiscal year. Other work during the year were gravity observations at Washington, D. C., resulting in improved methods that will increase the rapidity of this work; the erection of signals

for triangulation between Memphis, Tenn., and Huntsville, Ala.; measurement of a base line at Cheyenne, Wyo.; and revision of triangulation and determination of geographic positions in various localities along the coast. The results of geodetic work are issued as special publications of the Survey.

Magnetic and seismographic observations were recorded during the year at magnetic observatories maintained by the Survey at Cheltenham, Md.; Tucson, Ariz.; Vieques, P. R.; Sitka, Alaska; and Honolulu, Hawaii. Magnetic observations were made in the field at a large number of stations in the United States and in the Hawaiian Islands and meridian lines were established when requested by local authorities. Observations were made at sea by vessels of the Survey in the course of surveying operations. Magnetic information was supplied in reply to a large number of requests from engineers, surveyors, and others interested.

Wire-drag examinations were made on the coast of Maine, in the vicinity of Matinicus Island, in the outer approaches to Penobscot Bay; in Buzzards Bay, Mass.; in the vicinity of the entrance to the Cape Cod Canal; in Duck Island Harbor of Refuge, Conn., between Menunketesuck Point and Hammonasset Point; and in the approaches to Key West, Fla.

The steamer *Hydrographer* was employed on the coast pilot examination on the coasts of Connecticut, New York, and New Jersey, and in hydrographic surveys on the coast of North Carolina.

The steamer *Endeavor* was employed on the hydrography of the coasts of Rhode Island, North Carolina, and South Carolina.

The steamer *Bache* made hydrographic surveys at the entrance to Chesapeake Bay and was engaged in oceanographic examinations between the Capes of Virginia, Bermuda, and Habana, Cuba.

The schooner *Matchless* made hydrographic surveys in the East Branch of Elizabeth River, Va., and in the vicinity of Cape Charles, Va.

One party was engaged in a resurvey of Newark Bay and Passaic River, N. J., and another in revising the coast-pilot directions for the Potomac River.

Several parties were engaged in chart revision on the Atlantic coast, and an officer with headquarters at New York has acted as inspector for the section of the coast between Narragansett Bay and Delaware Bay.

On the Pacific coast the steamer *Gedney* was employed during the winter on a revision of the survey of Bellingham Bay, Wash., and a party was employed in a resurvey of Suisun Bay. A revision was also made of the survey of the water front at Seattle, Wash.

An officer stationed at Seattle was engaged in inspection duty on the coasts of Washington and Oregon and another with headquarters at San Francisco performed similar duty for the coast of California.

The steamer *Explorer* was employed in the survey of the approaches to the Kuskokwim River, Alaska, and in the survey of Icy Strait.

The steamer *Yukon* cooperated with the *Explorer* in the survey of the approaches to the Kuskokwim River.

The steamer *Patterson* was engaged in surveys in the Shumagin Islands in the vicinity of the Unimak Pass and search for the reported Leonard and Anderson Rocks, coast of Alaska, and during the winter season continued hydrographic surveys in the Hawaiian Islands.

The steamer *McArthur* was employed in surveys on the west shore of Cook Inlet, Alaska.

The steamer *Taku* was employed in surveys in Prince William Sound, Alaska, and made a special examination at the head of Passage Canal.

The steamer *Gedney* was employed on general surveys on the west coast of Prince of Wales Island, Alaska, including Bucarelli Bay, Klawak Inlet, Tonawek Bay, Sukwan Strait, and Mears Passage, Alaska.

An officer of the Survey, detailed to duty as director of coast surveys with headquarters at Manila, has direction of all field work in the Philippine Islands. The details of this work are mentioned elsewhere in this report.

The steamers *Pathfinder*, *Research*, *Romblon*, *Marinduque*, and *Fathomer* were engaged in that work. Of these vessels all except the *Pathfinder* are the property of the Philippine government, which provides the crews and keeps the vessels in repair. The salaries of the officers of all vessels are paid by the United States. The running expenses and outfit of the steamers *Romblon* and *Marinduque* are also paid by the United States. The running expenses and outfit of the steamers *Fathomer* and *Research* are paid by the Philippine government.

The steamer *Pathfinder* was employed on general surveys on the east coast of Mindanao and in the approaches to Manila Bay.

The steamer *Research* was employed in the region of the Samar Sea.

The steamer *Romblon* made surveys in the Calamianes and northern Palawan.

The steamer *Marinduque* was employed on the east coast of Palawan.

The steamer *Pathfinder* was employed in the Sulu Sea and vicinity.

Tide observations were made in connection with hydrographic surveys in the United States and its outlying territory, and at regular tide stations at Portland, Me.; Fort Hamilton, N. Y.; Atlantic City, N. J.; Philadelphia, Pa.; Baltimore, Md.; Key West, Fernandina, and Cedar Keys, Fla.; Galveston, Tex.; San Diego and San Francisco, Cal.; Seattle, Wash.; and Juneau, Alaska. Tidal indicators exhibiting automatically stage and height of the tide were maintained at Fort Hamilton, N. Y.; at New York City; and at Reedy Island, Delaware River.

Through the cooperation of the Bureau of Lighthouses current observations were made at a number of light vessels along the Atlantic coast. Similar observations were made when practicable by the hydrographic parties of the Survey.

STEAMBOAT-INSPECTION SERVICE.

Summary of Work.

During the fiscal year ended June 30, 1914, 318,094,347 passengers were transported on those vessels which are required by law to report the number of passengers carried. The total number of accidents which resulted in the loss of life during this period was 232, and the number of lives lost was 582, including passengers and crew, an increase over the previous year of 146. Of the total number of lives lost, 185 were from suicide, accidental drowning, and other similar causes, which leaves 397 which can fairly be chargeable to accidents, collisions, explosions, foundering, etc. The total number of passengers who lost their lives was 105, which is a ratio of 1 life lost for every 3,029,469 passengers carried.

The number of vessels inspected and certificated in the fiscal year 1914 was 7,930, with a tonnage of 9,970,510, a decrease of 35 in number, with an increased tonnage of 898,518, compared with the previous fiscal year. Of the vessels certificated 6,217 were domestic steamers, with a tonnage of 5,079,432, a decrease of 178 in number and of 30,137 tons; and 545 were foreign passenger steamers, with a tonnage of 4,374,006, an increase of 95 in number, and of 946,692 tons. Sail vessels and passenger barges to the number of 27 were inspected, with a tonnage of 12,734, a decrease of 6 in number and of 3,564 tons; and also 564 seagoing barges, of 473,318 tons, an increase of 7 in number, with a decrease in tonnage of 19,230. Five hundred and seventy-seven motor vessels, with a tonnage of 31,030, were inspected and certificated, an increase of 47 in number and 4,767 tons.

Licenses were issued during the year to 18,871 officers of all grades, a decrease of 7,611 from the preceding year. There were 4,829 applicants examined for visual defects, 61 of whom were rejected and 4,768 were passed. Compared with the previous year, these figures show a decrease of 2,841 in the number examined and 2,818 in the number passed.

At the various mills 3,159 steel plates for the construction of marine boilers were inspected, a decrease from the previous year of 49, and of this number 166 were rejected. In addition to these

plates, there were inspected at the mills a large number of steel bars for braces and stay bolts for marine boilers and also several hundred plates for stock and repair purposes. Many requests were received from other branches and departments of the Government for the testing of boiler material at the mills. These received the attention of the Service, and prompt reports were rendered to the proper officials.

During the year there were examined and tested at various manufactories 174,122 life preservers, of which 1,210 were rejected.

The total number of permanent positions in the Service at the end of the fiscal year was 265, consisting of 188 officers, 76 clerks, and 1 messenger. Three vacancies existed in the Service on that date.

Activities of the Service.

The Steamboat-Inspection Service, as its name partly implies, exists for the purpose of inspecting those vessels of the American merchant marine which are required by law to be inspected; licensing officers of merchant vessels; conducting investigations of casualties and violations of law coming under its jurisdiction; regulating the transportation, on water, of persons and articles, and making certain inspections for other departments of the Government. Each of these subjects will be taken up and discussed in its respective order.

Hull Inspection.

Under the rules of the Board of Supervising Inspectors, blue prints descriptive of the hull construction of vessels of over 100 gross tons are required to be filed with the local inspectors of the districts where such vessels are to be inspected, but it is not at present required that these blue prints be approved by such inspectors. Some thought has been given to the question of requiring that the blue prints be approved by the Steamboat-Inspection Service, but the Department is convinced that this approval should not be given by the local inspectors. It is believed that there should be stationed in the Office of the Supervising Inspector General experts whose business it would be to pass upon proposed hull construction. This is deemed necessary, first, to provide the Department the expert advice which the subject requires, and second, to bring about a uniform administration of the law, with which the Supervising Inspector General is charged.

To adopt this plan would, however, require the enactment of a statute that would give this express authority to the Steamboat-Inspection Service, and there would be required an appropriation for the employment of the experts. Furthermore, it would be a distinct departure from the principles that have heretofore governed the Steamboat-Inspection Service in the matter of the jurisdiction of local inspectors, in that it would transfer from local inspectors to the central office the responsibility of passing on the certain features affecting the seaworthiness of vessels. It is a matter which requires careful thought, and is not one to be adopted without full and due consideration, but it is a situation that faces the Steamboat-Inspection Service to-day, and which will, as time goes on, require more and more attention.

The Steamboat-Inspection Service inspects vessels in order to make travel by water safer. While much has been done to provide lifeboat and fire-fighting apparatus, the most important thing to do is to make the ship itself as nearly unsinkable as possible. Having done this, there should be placed on board the vessel the proper equipment to take care of those who travel on the ship, and the vessel should be properly manned.

The greatest danger on board ship is from fire, and it is believed that in order to follow out the principle of making the ship itself as safe as possible, before taking up the question of equipment, the Government should require that all excursion steamers be fireproof throughout. By some it may be claimed that it would not be practicable to make excursion steamers absolutely fireproof, as to do so would prevent them from being commercially profitable, but a contrary view has been entertained for a number of years by the Supervising Inspector General of the Steamboat-Inspection Service. In the annual report of that officer for the fiscal year ended June 30, 1905, it was stated that the inflammability of the ordinary type of river and excursion steamer was a matter that should have the fullest consideration of the Department; that while fire is one of the worst conditions that have to be met, and the most appalling in its results, little or no effort had been made to design these steamers upon any different plan than those which had been in use for years. It was pointed out in that report that paints, compositions, and various other compounds of a so-called fire-proof character had been suggested and tried, but none seemed to have served its purpose. It was also pointed out that there was at that time in course of construction in one of the prominent shipyards of the country a river steamer nearly 300 feet in length

that had been designed with a view to having her as nearly fireproof as utility would permit.

In the annual report of the Supervising Inspector General for the fiscal year 1906, the construction and operation of a fireproof excursion steamer was said to have proven successful beyond the strongest hopes of those who conceived this type of construction, and the opinion was advanced that Congress should enact legislation requiring fireproof construction on all excursion steamers thereafter built or contracted for.

In the meantime, in the absence of fireproof construction on excursion steamers, the best precaution that can be taken against the loss of life and property is to maintain the very best fire-fighting equipment on such steamers, and to have these crafts manned with excellently drilled crews who are competent to fight fire in the event that necessity arises therefor.

Until Congress requires fireproof construction of excursion steamers, it is believed also that the use of some such sprinkler system as is now installed on many passenger steamers should be extended.

Boiler Inspection.

Uniform administration of the law, with which the Supervising Inspector General is charged, can be attained, so far as boiler construction is concerned, only by requiring that all boilers used on vessels subject to inspection shall first be approved by experts in the office of the Supervising Inspector General. While the inspectors in the field service have heretofore done excellent work in this respect, we nevertheless live in a period of progress and the Steamboat-Inspection Service should be no less progressive than modern and effective business organizations. The law should therefore be changed so as to require the approval by the Supervising Inspector General of the design of these boilers.

During the past year the Steamboat-Inspection Service has made special efforts to see that actual internal examinations, so far as may be possible, are made of all boilers. The inspectors have given this matter their careful attention and the importance of the actual internal examination has been so impressed upon them that better work than ever before is now being done in this direction.

In the logical development of business and of administrative methods increasing attention is given to detail. Certainly this has been true of boiler inspection as made by the Steamboat-Inspection Service. For example, particular attention is now

given to fusible plugs, which is mentioned merely as an illustration of the extent of the detail of boiler inspection. But as the work becomes more detailed, the necessity has arisen for an additional number of boiler inspectors.

At present numerous orders are being given for repairs to boilers, and in districts where the pressure of work is not particularly great personal attention can be given by the inspectors to seeing whether these repairs are actually made; but there are districts where the pressure of work is exceedingly great, while the number of inspectors is relatively small, and in them it is impossible to give boiler repairs the attention which safe navigation would require. The fact is that the day of the affidavit is past, and the day of the actual "follow-up" system is at hand.

With reference to boiler inspection, attention is invited to section 4433, Revised Statutes, which has long since passed the period of its usefulness, and is no longer adequate to meet the conditions it was designed to govern. For the purpose of determining the working steam pressure allowable on marine boilers it was perhaps at the time of its enactment all that was necessary, but materials, construction, and methods of operation have changed so greatly that it can no longer be utilized to fairly determine working pressure. In its present form it takes into consideration only the value of the plate and the respective values of single and double riveted lap joints. No value is allowed any other rivet plan than these two, and single or double butt-strap joints, with rivet plan of any design, receive no consideration whatever in determining allowable pressure beyond that mentioned. An examination of the rules and regulations of the leading boiler insurance companies of this country will show that section 4433 is not consistent with the best modern practice, and should, therefore, be amended so as to provide that every boiler hereafter constructed of plates inspected as required by Title I, II shall be allowed a working steam pressure as determined by the rules of the Board of Supervising Inspectors. The enactment of a statute containing such a provision would give to the Board of Supervising Inspectors that discretionary authority for arranging for boiler construction that it should possess if it is to make its rules meet the best modern practice.

Motor Vessels.

The thorough inspection of motor vessels from Key West, Fla., to Eastport, Me., by the Department's vessel *Tarragon*, has con-

firmed the existence of conditions which were described in my annual report for 1913, as follows:

The extension of the steamboat-inspection laws to the 250,000 motor boats which are said to exist in the United States is probably unnecessary, and is certainly impracticable without a large increase of the inspection force and of appropriations. Nevertheless, the existing conditions respecting motor boats should not be allowed to continue. The Supervising Inspector General has frequently referred to the desirability of extending the inspection of motor boats.

The Department inspects the hull and machinery of all steam vessels over 65 feet long and limits the number of passengers to be carried thereon, except that it has no authority to control the number of passengers carried on steam ferryboats.

As the law stands, only such steam vessels under 65 feet long as are tugs and tow-boats are inspected. Steam vessels less than 65 feet long carrying passengers are not inspected, nor are the number of passengers on such vessels directly limited—both for lack of legal authority. If steam vessels between 40 and 65 feet long carry passengers, the Department approves the design only of their boilers and machinery. It can only control the number of passengers to be carried on such vessels under the present law by the indirect means of regulating the life-saving equipment.

The Department, however, has no direct power over a motor vessel either as regards passengers or machinery. It can inspect the hull, tanks, and piping, but only when the vessel is of 15 tons measurement or more, and when it carries passengers or freight for hire. If, for example, the motor vessel is a private vessel of over 15 tons measurement, the Department can not inspect her in any way. Even if she is a towing motor vessel of this size, there exists no lawful power to inspect her.

The Department can not limit the number of passengers carried for hire on a motor vessel, however big, except by fixing the life-saving equipment. Over motor vessels smaller than 15 tons the powers of the Department are limited to seeing them provided with the necessary life-saving equipment, lights, life preservers, and means of extinguishing gasoline fires. Here the present powers of the Government stop.

I wish to make this perfectly plain. If a Government inspector stands upon a dock watching a motor boat sail away with three times as many passengers as she ought to have and her machinery defective and her hull leaking, he would have no power in the premises, were she a motor boat under 15 tons measurement, except to see that there was a life preserver in good order provided for every passenger on board, that she had the proper lights and the proper means of extinguishing gasoline fires, with a whistle and a bell of standard dimensions. He could, indeed, require such a vessel to have a licensed operator, but for that license no examination is required. The powers of the Department in this matter should be extended. Every man whose pleasures or pursuits take him upon the water may see that motor boats are frequently loaded with passengers or pleasure seekers beyond the margin of safety. Every motor vessel used for carrying passengers should be inspected by the local inspectors of steamboats and given a certificate of inspection. The examination need not be of such detail as that of a steamer, but it should be sufficiently thorough to assure the passengers and the public that such boats are in good condition. It should, however, further be provided that motor vessels may not transport passengers in excess of a fixed number, perhaps 20 or 25, unless such boats have been subjected to the full inspection prescribed for steam vessels, and unless those in charge of them have been licensed after examination in the same manner as corresponding officers on steam vessels. At present a person may obtain a license as operator of motor vessels without being a citizen of the United States or without being 21 years of age, and while being unable to read or write. Under the law, licenses to operators of motor boats are issued without any examination whatever. The inspectors of the inspection service are without authority to ask whether the person applying for such motor-boat license is color blind or whether he understands or can read the pilot rules. Yet such persons, having a

license so obtained, may, and in fact do, take charge of motor vessels carrying passengers for hire. Operators of motor boats should be required to show that they are not color blind and have good vision, that they can read the pilot rules and laws, and that they have a reasonable knowledge of them. The existing conditions are a menace to the lives of innocent and unsuspecting passengers and should not be permitted to continue.

The measures proposed could be carried into effect in a reasonable time and at a moderate expenditure of the public funds and would involve no hardship or undue restraint upon an important industry. The inspection would put the owner of the boat to no expense. The reckless navigation of an uninspected motor vessel jeopardizes the lives of passengers on inspected vessels, as well as those on the motor boat itself.

The numbering of motor boats for identification as automobiles are numbered is very desirable.

A bill to provide for the numbering of motor boats in an economical manner, involving the minimum of cost to the owners of these boats and to the Government, has already been sent to Congress by the Department.

Licensing of Officers.

In licensing officers of the American merchant marine, inspectors of the Steamboat-Inspection Service must regard not only the physical condition of those who apply for licenses, but also their mental equipment, to determine whether they are safe persons to intrust the navigation of vessels subject to inspection. The licensing of officers during the past fiscal year has been unusually extensive, and while at first the available supply of third mates was not large enough to meet the demand it is believed that now there is a sufficient number to man properly all vessels to which the law applies.

The so-called "seamen's bill," which is now before Congress, provides for certificating lifeboat men. While the bill requires the local inspectors to certificate these men and keep a list of the names of those to whom certificates are issued, it is also the plan of the Supervising Inspector General to maintain in the central office a complete list of all lifeboat men who receive certificates from local inspectors.

Transportation of Persons.

Measures which have been adopted to prevent overloading of passenger steamers were described in my report for last year. This is a matter governed largely by certificates of inspection, which limit the number of persons that may be carried. Special effort is made to detect overloading of passenger vessels after the issuance of the proper certificate. Inspectors are giving constant attention to the passenger-carrying allotment of passenger and excursion steamers, and the number of passengers permitted to

be carried now is relatively smaller than was permitted to be carried a few years ago. In any event, the original jurisdiction is placed by law in the hands of the local inspectors, and it has been impressed upon those officers that they will be held accountable for a strict performance of their duty in this respect.

During the past fiscal year there was put into use a new form for reporting on a card the number of passengers carried. As these cards were received in the Bureau they were carefully examined, and in every instance where it appeared that there was overloading, or a suspicion of it, the case received prompt and immediate attention. It is not steamers subject to inspection that violate the law or on which danger exists in the matter of carrying passengers; where danger exists is on motor vessels not subject to inspection and in some instances on motor vessels subject to inspection. In this connection attention is invited to the fact that under the present law there is no authority to restrict the number of passengers that may be carried on vessels other than steam vessels and for the purpose of correcting this condition it has been proposed that section 4464, Revised Statutes, be amended to read as follows:

Sac. 4464. The inspectors shall state in every certificate of inspection granted to vessels carrying passengers, other than ferryboats, the number of passengers of each class that any such vessel has accommodations for and can carry with prudence and safety.

It will be noted that the desire is to substitute the word "vessel" for "steamer."

Under present conditions the situation, as concerns motor vessels, is partly met by their equipment—that is to say, the vessels are boated according to the number of persons they carry—but it must be obvious to anyone that this is an attempt to control a dangerous situation by indirect methods, which are never satisfactory. Is it necessary that in order to eliminate the danger of carrying too many persons on motor boats there shall be some great catastrophe? In the light of the past, why is it necessary that this lesson should be brought home at such cost? Attention is called to this matter so that proper legislation to correct this very dangerous condition may be considered by Congress.

Transportation of Dangerous Articles.

Perhaps, in the effort to protect lives, the danger that exists from the transportation of dangerous articles is underestimated. The Steamboat-Inspection Service endeavors to control as much

as possible the transportation of dangerous articles on steamers carrying passengers, and while in some instances the Service has been conservative in this respect it is believed that it has acted on the side of safety, and in such a course public opinion will always support it.

Attention should be given to the extent of the authority of the Steamboat-Inspection Service over the transportation of dangerous articles on nonpassenger steamers. While from the commercial standpoint there are no passengers on these freight vessels, the Government nevertheless owes it to their crews to protect them. Further, the carrying of dangerous articles in a dangerous manner on steamers that are not carrying passengers endangers the lives of those on passenger-carrying steamers which are navigating in their vicinity. The jurisdiction of the Steamboat-Inspection Service should, therefore, be extended to the transportation of dangerous articles on nonpassenger steamers.

Extension of the Service.

Reference has been made to the extent to which the details of hull inspection have been developed; the extent to which the details of equipment have advanced; the attention which inspectors are required to give not only to the approval of blue prints of boilers but also to following up repairs that are ordered thereon. The desirability of extending the inspection of motor vessels has been pointed out. The importance of reinspections is very evident, but the inspectors of the Steamboat-Inspection Service have not in all instances been able to make all the reinspections or dry-dock examinations that are required. This is not the fault of the inspectors or of the system, but is due to the Service not having a sufficiently large number of men to perform its work.

It is useless to pass more exacting laws or for the Board of Supervising Inspectors to go into any greater detail in the matter of the Rules and Regulations until Congress shall have given the Steamboat-Inspection Service enough men to enforce the laws and carry out in an intelligent manner the rules that already exist. In some districts men are required to work from 5 o'clock in the morning until 10 or 11 o'clock at night. Such a thing should not be. Such a condition is wrong. A great and powerful Government such as ours should certainly provide a sufficient number of inspectors to properly perform these duties. If disasters occur as a result of lack of thoroughness, the responsibility will not rest upon the Steamboat-Inspection Service.

The importance of this matter should be clear to Congress, and, as already stated, it should not be necessary for a great disaster to occur before the necessary steps are taken to prevent further disaster.

If there is to be given to this Service the licensing of seamen, it is evident that the work of the field service will be substantially increased; and in order to centralize and have uniform standards for the approval in the office of the Supervising Inspector General of hull and boiler construction there must be a larger number of men in the central office.

The Steamboat-Inspection Service has a very excellent organization, as well as splendid systems that result in the fixing of responsibility, but systems are of no effect, and organization amounts to nothing, if sufficient men are not furnished to properly operate the machinery. The Steamboat-Inspection Service is so organized as to be capable of indefinite expansion, but it is to-day up to the limit of its endurance. The cry of the Service is for more men, and unless more men are furnished the proper standard of inspection can not be maintained.

Division of Districts.

During the past fiscal year a new board of local inspectors was established at Los Angeles, Cal. This was in accordance with legislation which permitted the district of San Francisco, Cal., to be divided, whereby two boards of local inspectors now cover the territory that was once covered by one, with the result that more prompt attention is given to the business of the Service and more detailed attention is given to inspection.

In the annual report of the Supervising Inspector General for the fiscal year ended June 30, 1913, reference was made to the need for dividing the first supervising inspection district, which at present comprises the local boards of San Francisco, Cal.; Los Angeles, Cal.; Portland, Oreg.; Seattle, Wash.; St. Michael, Alaska; Juneau, Alaska; and Honolulu, Hawaii. The supervising inspector in charge of this district is stationed at San Francisco. This one officer has under his jurisdiction the entire Pacific coast and a good part of the Pacific Ocean. He is a capable man, but it does not need any argument to convince one that the work of at least two men is being required of him, and that it is not possible for one man in such a district as this to give proper attention to all matters coming under his jurisdiction. The first supervising inspection district should be divided and a new district should

be created, to include the local inspection districts of Seattle, Portland, Juneau, and St. Michael, with a supervising inspector stationed at Seattle, Wash. Such an arrangement would leave in the old first district the local districts of San Francisco, Los Angeles, and Honolulu, with the supervising inspector stationed at San Francisco, Cal.

Summary of Proposed Legislation Affecting the Service.

It is believed that the system of issuing certificates of inspection should be changed. Apparently it is not necessary to furnish vessels with a large number of copies of certificates as required by present practice. The same purpose would be served if the local inspectors were to furnish the original certificate direct to the vessel and supply the collector or chief officer of customs with a copy. The result would be a saving in the number of copies of certificates of inspection to be made up, and the original copy would go to the master or owner of the vessel, which should always have been the practice. A recommendation that the law be amended in this respect is now receiving the consideration of the Department.

It is evident from what has already been said that the name "Steamboat-Inspection Service" is not a proper designation for this Service. Its activities are too varied to be designated by such a narrow term, and the necessary legislation will be requested to the end that the name may be changed to "Marine-Inspection Service."

Careful attention should be given to the drawing of a new motor-boat law. Such an act should be simply worded and easily understood, and contain every necessary provision to properly protect human life.

It is believed that section 4464, Revised Statutes, should be amended, as already pointed out, so that inspectors of this Service may have undisputed jurisdiction over the number of persons that shall be carried on vessels.

Section 4472, Revised Statutes, should also be amended so as to extend the authority of the Steamboat-Inspection Service, and invest it with jurisdiction over the transportation of dangerous articles on nonpassenger steamers as well as on passenger-carrying steamers.

Proper legislation looking to fireproof construction of excursion steamers should be enacted, and in the interest of good administration, legislative authority to divide the first supervising inspection district should be granted by Congress.

BUREAU OF NAVIGATION.

Tonnage of the Merchant Marine.

The total documented merchant shipping of the United States on June 30, 1914, comprised 26,943 vessels of 7,928,688 gross tons. This tonnage is the largest in our history, and it is gratifying to note that of the total 2,360 vessels of 1,066,288 gross tons are registered for foreign trade. During the year 1,151 vessels of 316,250 gross tons were built in the United States.

A sweeping change in our traditional maritime policy was effected by the act of August 18, 1914, which removed the restriction of American registry to vessels built in the United States and officered by American citizens. This change brings our laws in accord in these respects with the laws of Great Britain, Norway, and other maritime nations. While the passage of this act was hastened by the outbreak of the European war, it was in fact in the line of a manifest tendency for some years toward change in a maritime policy which had been outgrown and had hampered rather than fostered our progress on the seas.

Section 5 of the Panama Canal act of 1912 provided for the admission to American registry for foreign trade of vessels built abroad not more than five years old. Convinced that this age restriction would prevent the growth of our merchant marine as rapidly as the growth of our foreign trade permitted, in consequence of a more liberal tariff policy, I suggested in March, 1914, the removal of that restriction. A bill to give effect to this suggestion (H. R. 14661) was introduced on March 16, but was not acted on until August, when the need of such legislation was brought home to all by the sudden check upon ocean foreign trade and transportation for the few weeks immediately following the outbreak of war in Europe.

During the past 25 years considerable amounts of American capital have been invested in shipping under foreign flags. While there have been, of course, no exact figures available, it has been generally understood that American capital had built or controlled about 150 ocean vessels, aggregating about 600,000 gross tons, the owners of record of which were Belgian, British, or German subjects, and, in a few instances, of other nationalities. The law

forbade American registry to such ships, which were built abroad. Furthermore, the laws allowed none but Americans to act as officers on American ships. The act of August 18 removed these restrictions and thus enabled American property, continuously held in some instances for years, to assert truthfully its national character by the recognized national emblem and national papers at sea.

The second section of the act gave the President large discretionary powers, which were exercised in an Executive order issued on September 4. Between that date and October 15, 74 vessels of 267,240 gross tons were registered either at the customhouses or, in a few instances, provisionally by American consuls at foreign ports under forms and regulations agreed upon by the State Department and the Department of Commerce and based on established American and international custom and precedent.

The suspension for two years of the laws concerning survey, inspection, and measurement in the case of foreign-built vessels admitted to registration will afford the opportunity for the revision of such laws, wherever it may be found desirable in the interest of competitive navigation. A critical examination of those laws, however, will show fewer embarrassments arising from acts of Congress than many who have not read those laws are disposed to believe. The principal restriction designed in the interest of domestic shipbuilding has been permanently removed in the case of seaworthy vessels, and the requirement that foreign-built vessels must be certified as safe to carry dry and perishable cargo should not be repealed until the system of inspection has been reestablished.

The law requiring masters and other officers to be citizens of the United States, the second important restrictive feature of our navigation laws, has been suspended for a period long enough to enable us to determine its full effects. I am disposed to believe that in time it will enlarge the field of employment of competent American officers and engineers. Such, at all events, seems to have been the result when Great Britain enacted similar laws. The British act admitting to British registry ships built outside British territory was enacted in 1849, but with small results until in 1854, when Great Britain repealed the laws requiring the officers and crews of British ships to be British subjects. The Norwegian merchant marine has attained its development under similar liberal laws.

Navigation Receipts.

The receipts from tonnage duties last year were \$1,310,759.03, compared with \$1,273,789.43 the previous year, and are the largest annual receipts from this source in over 30 years. These duties are imposed without discrimination on vessels of the United States and vessels of foreign nations under reciprocal treaties entitled to equal treatment with vessels of the United States, and, consequently, are in no sense a handicap on American shipping. The rates imposed—6 cents per net register ton for five voyages during a year on over-sea voyages, and 2 cents on vessels arriving from foreign ports in North America, Central America, and the West Indies for five voyages—are appreciably less, as a rule, than corresponding charges levied in the ports of South America, Europe, Asia, and Africa. They are one of the lightest burdens we impose on foreign trade. During the current fiscal year the receipts from this source will be considerably reduced in consequence of our diminished foreign trade, owing to the European war.

The receipts from navigation fees during the year amounted to \$152,694.19, almost all of which was collected from vessels in foreign trade. The amount is insignificant in proportion to the value of our exports and imports, which aggregate over four billions of dollars annually. Whenever the balance sheet of our national receipts and expenditures permit, the Department will favor the abolition of these fees, which are collected in small amounts, usually less than \$5 in the case of any ship, and require, accordingly, clerical attention and a corresponding high cost of collection.

The collections from navigation fines during the year amounted to \$40,741.38. The increasing amount of these fines is due to the more effective enforcement of the navigation laws.

The receipts from the three sources named aggregate \$1,504,194.60. In addition to these annual revenues, the sum of \$446,870.50 was collected during the year under section 37 of the tariff act of 1909, imposing an excise upon foreign-built yachts owned by Americans. The Supreme Court of the United States in the case of *Billings v. United States* (232 U. S., 261) sustained on February 24, 1914, the constitutionality of the tax, and in its decision also required the payment of interest on the amounts due since 1909 but not collected pending the determination of the constitutionality of the law. This amount is an extraordinary receipt, and the section of the tariff act of 1909 under which it has

been collected was repealed by the tariff act of October 3, 1913. The repeal of the excise on foreign-built yachts accords in principle with the ship-registry act of August 18, 1914.

Shipping Commissioners.

Shipping commissioners at 15 seaports shipped, reshipped, and discharged during the year 378,772 seamen on vessels of the United States, a decrease of 416 compared with the previous year. The amount of salaries was \$63,475.20, an increase of \$1,101.07 over the previous year. In view of the necessity of the most rigid economy in all branches of the public service, the estimates for shipping commissioners provide for only one additional clerk at New York and New Orleans, respectively. The ship-registry act of August 18, 1914, will materially increase the work of shipping commissioners, as they must perform the duties with respect to the crews of the vessels transferred to the American flag formerly performed by foreign consuls. The registry act has been in effect for too short a time to permit any useful estimate of the increase in the work of shipping commissioners which it will entail, or to determine the ports where this work must be performed. The ships thus far registered, however, are engaged in trade mainly with South America and Central America, though the trade with Gulf ports will soon become more important. The opening of the Panama Canal will also contribute to the importance of these ports and will, of course, give added rank to Honolulu. From present indications it will be desirable another year to establish shipping commissioners' offices at Honolulu, Mobile, and possibly at Galveston. The successful operation of these offices is essential to our maritime development.

Radio Communication.

The work of the Bureau of Navigation in enforcing the laws relating to radio communication and the London International Radiotelegraphic Convention, proclaimed by the President on July 8, 1913, during the past year was practically double the work done during the fiscal year ended June 30, 1913. Ship inspections numbered 6,486, compared with 3,201 during the previous year. The number of stations licensed in accord with the international convention and with the act of Congress numbered 2,309. Examinations were held by the Bureau's inspectors of 2,245 applicants for licenses as radio operators, of whom 1,547 were found competent

and licensed. The increase in work of this service has been accompanied by a steady elevation in the standards of efficiency of apparatus and operators, and this relatively new branch of public service may now be regarded as on a firm basis. The increase in the volume of work has been possible only through the employment of low-salaried clerks, permanently or temporarily, to relieve of routine work the inspectors, who are men of scientific attainments, and enable them to devote nearly all their time to tests of apparatus and operators. A year ago the service was practically confined to New York, Baltimore, New Orleans, and San Francisco, but it was extended during the past year to 23 principal seaports and to 10 ports on the Great Lakes. It is gratifying to note that the general principles of our system of Government regulation of radiotelegraphy, namely, the compulsory equipment with radio apparatus of vessels carrying 50 persons or more and the maintenance of a continuous wireless watch and of auxiliary equipment, were adopted by the International Conference on Safety of Life at Sea, and when the international convention shall have been ratified the rules now applied to American ships in the interests of safety will be applied by all the maritime nations.

Both the voluntary and statutory use of radiotelegraphy is increasing rapidly, and for this reason there must be a moderate annual increase in the appropriations for the inspection service. Congress recognized this fact by appropriating \$45,000 to the service for the current year, and the estimates for next year call for \$47,525.

Some slight changes in the act to regulate radio communication, which will be submitted in detail later, should be made to accord with the London International Radiotelegraphic Convention, and changes in slight detail will be desirable to conform to the International Convention on Safety of Life at Sea. I deem it more important, however, that Congress should provide for some regulation of the rentals of stations on shipboard. Control over the rates for messages is now lodged in the Department of Commerce, and if for any reason the regulation of rentals should not be intrusted to this Department it might be assigned to the Interstate Commerce Commission or to the new Federal Trade Commission.

Enforcement of Navigation Laws.

During the fiscal year 1914, 6,720 violations of the navigation laws were reported to the Department through applications for the mitigation or remission of penalties, compared with 3,506

similar cases during the fiscal year 1913. The amount collected from mitigated fines amounted to \$40,741.38, the number of violations of law and the amount of penalties collected exceeding those of any previous year. This fact is not evidence of an increasing disregard for law, but of the more effective enforcement of the acts of Congress, which has resulted in safer conditions of navigation. It has been conclusively demonstrated that the most effective and economical method of enforcing these laws is through the employment by the Department of small vessels engaged exclusively in this work. The motor boat *Tarragon* during the year reported 1,762 violations of law and was operated along the entire Atlantic coast from Key West, Fla., to Eastport, Me., visiting practically all bays, sounds, and harbors, and ascending many of the rivers flowing into the Atlantic. The work of this boat is educational rather than punitive, and except in aggravated cases the penalties incurred for violations, many of which were first offenses, have been mitigated to nominal amounts. The Department has received from many sources testimony to the improved conditions in navigation which have resulted from the visits of this vessel. Congress has now provided for the purchase of another boat which will be used in conjunction with the *Tarragon* for Atlantic coast inspections. It is proposed during the coming winter again to make a thorough inspection of the vessels in the oyster fleet on Chesapeake Bay, on which about 3,500 men are employed. Two years ago such a visit by the *Tarragon* resulted in a marked improvement of the treatment of men aboard the oyster fleet, and in their quarters, food, and sanitary conditions. The abuses which had formerly existed practically ceased. A repetition of the visit is needed to preserve the good results already secured. The work done by the *Tarragon* is not only thorough but economical, the operating expenses during the year aggregating \$7,386.29, while the mitigated penalties already collected amount to \$4,905 with 331 cases remaining to be settled. Beyond operating expenses, \$3,305.60 was expended in new construction and extraordinary repairs mainly to adapt the vessel for service on the New England coast. Under ordinary conditions the amount of mitigated penalties collected from fines imposed in consequence of the inspections of a vessel of this type should meet all the ordinary running expenses.

Another method of enforcing the navigation laws is by the allotment to collectors of customs of small amounts for the hire of vessels for inspection purposes. In this manner, during the past

fiscal year, reports of 1,325 violations of law were secured. This method, however, is not wholly satisfactory, as it involves the employment of temporary inspectors who are not trained to the work, and as only small amounts can be allotted to each port systematic inspections are impossible. Since the reorganization of the Customs Service there has been a marked improvement in the work by customs officers under these allotments and it is proposed, if possible, during the coming year to extend this work, especially in ports where the navigation season is comparatively short and the purchase of vessels would not be warranted. During the year 768 cases of violations of the steamboat-inspection laws were reported to the Department, most of these violations involving a shortage in the licensed officers on the vessels. The work of enforcing the navigation laws has to do directly with safeguarding life and property on the water, and, as stated in my report of last year, I believe that a sum equivalent to the penalties collected for violation of these laws should be set apart annually for the use of the Department in extending its efforts to enforce them. The sum of \$30,000 asked for in the estimates this year for this purpose is \$10,741.38 less than the amount actually collected as navigation fines during the past fiscal year.

The following is a statement of violations of navigation laws reported by the various collectors of customs showing the laws violated and the work done by the Revenue-Cutter Service, the motor boat *Tarragon*, local inspectors of steam vessels, radio inspectors, and customs officers, the work of the customs officers under allotments made by the Department being shown in the last column of the second half of this tabulation.

Port.	Total.	Steamboat laws (4399-4500, R. S.).	Motor-boat law "Rules of road."	Surrendered license (4325-4326, R. S.).	Bills of health (Feb. 15, 1893). ^a	Anchorage and St. Marys River rules. Passenger act (Aug. 2, 1882).	Enrollment and li- cense (4336, R. S.).	Entry and clearance (3774, 4197, R. S.).	Name on vessel (4178, R. S.).	Change of master (4335, R. S.).	Unloading.	Radio-communication laws.	Miscellaneous.
Baltimore, Md.....	219	45	130	17	.....	.....	2	.....	20	3	1	1	.....
Boston, Mass.....	949	40	868	27	.....	4	.....	2	.....	1	2	5	.....
Bridgeport, Conn.....	134	7	104	18	.....	.....	.....	.....	3	.....	2	.....	.....
Buffalo, N. Y.....	3	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
Burlington, Vt.....	54	.....	54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Charleston, S. C.....	154	12	104	32	.....	.....	.....	.....	3	2	1	.....	.....
Chicago, Ill.....	105	14	82	6	1	.....	2	.....	.....	.....	.....	.....	.....
Cleveland, Ohio.....	90	.....	66	15	.....	.....	3	.....	.....	1	5	.....	.....
Des Moines, Iowa.....	160	.....	139	19	.....	.....	.....	.....	2	.....	.....	.....	.....

^a Bills of health cases transferred to Treasury Department July 24, 1911.

Port.	Total.	Steamboat laws (1899-1904, R. S.).	Motor-boat law "Rules of road."	Surrendered license (1898-1904, R. S.).	Bills of health (Feb. 14, 1891).	Anchorage and St. Marys River rules.	Passenger act (Aug. 3, 1889).	Enrollment and li- cense (1916, R. S.).	Entry and clearance (1874, 1897, R. S.).	Name on vessel (1878, R. S.).	Change of master (1915, R. S.).	Unloading.	Radio-communica- tion laws.	Miscellaneous.
Detroit, Mich.....	112	4	75	8	7	1	1	1	1	1	10	1	1	
Duluth, Minn.....	17	1	11	4										
Eagle Pass, Tex.....	2			2										
Galveston, Tex.....	40	24	17	3				1	2	1	1	1		
Honolulu, Hawaii.....	15	1	3	1				1	4	1	4			
Indianapolis, Ind.....	1													1
Jacksonville, Fla.....	669	20	517	85				4	16	10	9		8	
Juneau, Alaska.....	41	5	2	23				5	2	2	2			
Laredo, Tex.....	14		8	5						1				
Los Angeles, Cal.....	79	6	53	9				4	4	1	1		2	
Louisville, Ky.....	41		33	8										
Memphis, Tenn.....	10		2	8										
Milwaukee, Wis.....	16	3	7	2				1	2			1		
Mobile, Ala.....	157	4	123	32		1	2	2	2		1			
New Orleans, La.....	218	2	204	3		3								
New York, N. Y.....	1,013	237	673	39		13	5	5	17	6	2	11	5	
Norfolk, Va.....	225	73	78	69					9	2	3		1	
Ogdensburg, N. Y.....	57	5	48					3	1					
Philadelphia, Pa.....	378	55	265	37				1	12	3	2	2	1	
Pittsburgh, Pa.....	21	2	20	3										
Port Arthur, Tex.....	126	50	57	13		1					4		1	
Portland, Me.....	78	10	50	10					3	4			1	
Portland, Oreg.....	354	6	339	2				1	1				5	
Providence, R. I.....	130	65	51	9				2	1		1		1	
Rochester, N. Y.....	34		34											
St. Louis, Mo.....	109	3	79	17						5	5			
St. Paul, Minn.....	5	1	4											
San Francisco, Cal.....	260	19	157	12		2	5	4	12	10	21	11	1	
San Juan, P. R.....	28	5	11	2				1				4		5
Savannah, Ga.....	98	18	59	4				1	9	1	3	1	2	
Seattle, Wash.....	381	10	248	26		1	4	3	14	4	2	3	6	
Wilmington, N. C.....	104	2	80	1				2	7	2	4			
Total—														
1914 (49 ports) ^a	6,720	768	4,838	631	2	25	41	26	153	59	90	36	45	
1913 (107 ports).....	3,506	333	2,783	23	23	2	24	10	83	26	1	40	152	
1912 (105 ports).....	3,634	165	3,119	96	3	12	38	39	81	12			52	
1911 (92 ports).....	2,268	122	1,812	23	41	17	45	10	43	30			50	
1910 (74 ports).....	1,070	252	488	17	52	13	61	13	68	12			76	
1909 (64 ports).....	1,134	151	710	33	69	3	21	14	7	59		4	63	
1908 (73 ports).....	852	245	385	12	42	6	21	23	12	30	7		61	
1907 (66 ports).....	684	209	222	28	36	12	22	9	23	27	5		62	
1906 (77 ports).....	670	194	130	114	41	13	27	10	6	49	5	9	72	
1905 (63 ports).....	524	142	53	99	42	13	21	26	7	20	11	28	62	
1904 (66 ports).....	706	124	93	101	42	49	26	29	12	24	19	(b)	131	

^a Reports are now made by subports through the principal port of the district.

^b Included under "Miscellaneous" in 1904 report.

CASES REPORTED TO COLLECTORS OF CUSTOMS.

Port.	By revenue cutters.	By Tar-ragon.	By local inspectors.	By radio inspectors.	By customs officers.	Cases reported under allotments.
Baltimore, Md.....	47	105	16	1	30	6
Boston, Mass.....	66	118	28	3	746	157
Bridgeport, Conn.....	14	14	3		103	20
Buffalo, N. Y.....	1		1	1		
Burlington, Vt.....					54	34
Charleston, S. C.....	53	59	4		38	
Chicago, Ill.....	69		18		24	82
Cleveland, Ohio.....	24	1			65	41
Des Moines, Iowa.....	73				87	66
Detroit, Mich.....	63	4	2		43	20
Duluth, Minn.....			1		16	
Eagle Pass, Tex.....					2	
Galveston, Tex.....	4		8		37	8
Honolulu, Hawaii.....	9				6	
Indianapolis, Ind.....					1	
Jacksonville, Fla.....	3	477	9		180	48
Juneau, Alaska.....	2		1		38	
Laredo, Tex.....			8		6	8
Los Angeles, Cal.....	11		1		67	47
Louisville, Ky.....			1		40	30
Memphis, Tenn.....					10	2
Milwaukee, Wis.....	9		2	1	4	
Mobile, Ala.....	2		4		151	113
New Orleans, La.....			189		89	202
New York, N. Y.....	60	391	265	12	83	
Norfolk, Va.....	8	43	73		111	
Ogdensburg, N. Y.....		45			12	8
Philadelphia, Pa.....	8	143	49	2	176	
Pittsburgh, Pa.....			16		5	
Port Arthur, Tex.....		16	6		104	
Portland, Me.....	38	2	6		32	
Portland, Oreg.....	37		2		315	
Providence, R. I.....		50	68		12	
Rochester, N. Y.....	2				32	31
St. Louis, Mo.....	5		2		102	75
St. Paul, Minn.....					5	4
San Francisco, Cal.....	168		4	3	85	16
San Juan, P. R.....	6		4		18	
Savannah, Ga.....	12	17	1	1	67	
Seattle, Wash.....	114		5	3	259	136
Wilmington, N. C.....	14	81	9			
Total.....	922	1,762	734	27	3,275	1,325

The foregoing statement of the work done by the various inspection services is based on reports made by collectors of customs on Cat. 1078 and is approximately correct. At Chicago, however, the allotment made by the Department was used by a revenue-cutter officer and that Service, as well as the allotment, has been credited with the results. At Galveston, Tex., Laredo,

Tex., and New Orleans, La., the local inspectors are credited with 145 cases, 137 of which were reported by a local inspector whose expenses were paid by an allotment. The statement of cases reported under the Department allotments necessarily is approximate only.

Passenger Act of 1882.

Especial attention has been paid during the year to the enforcement of the passenger act of 1882, and the Department is gratified to note that the steamship companies are cooperating with the inspectors in endeavoring to carry out the spirit as well as the letter of the law. During the year passenger steamers subject to the act, carrying 1,016,453 steerage passengers, made 1,797 entries in ports of the United States, which were subject to detailed inspections covering all the requirements of the law. The act itself looks to the health, comfort, and decency of those traveling in the steerage, and its importance has justified the Department in establishing a system of inspection which is more complete and thorough probably than under any other of the navigation laws. Vessels are boarded on arrival by two inspectors who not only see that the provisions of law have been observed, but passengers are questioned as to conditions which have obtained throughout the voyage.

General Anchorage Law.

The enactment of a general law to define anchorage grounds for vessels and enforce the observance of regulations is again recommended. A bill to carry out this purpose was passed in the Senate two years ago and by the House at the last session. Such an act is very desirable in the interests of safe navigation and commerce. The present law for New York Harbor vests authority in the Department of Commerce, but to my mind it is a matter of relatively little consequence by what department the general work is done, provided it be done effectively and economically.

Safety of Life at Sea.

The International Convention on Safety of Life at Sea, which embodies the unanimous recommendations of the international conference at London, was transmitted to the Senate by the President on March 17, 1914. I earnestly favor its ratification at the earliest practicable day. The scope of the convention and the method of its preparation were so clearly and concisely set forth

in the letter of the Secretary of State dated March 13, 1914, that I can not do better than to quote his words:

The convention embodies the unanimous conclusions of the International Conference on Safety of Life at Sea which met at London from November 12, 1913, to January 20, 1914. The conference was comprised of the representatives of the 14 principal maritime nations and of three of the self-governing British dominions. It was called in a large measure upon the suggestion of the Government of the United States, and the advice of the American delegation was influential upon a great many particulars which entered into this convention. The conference was composed of men trained to the sea and experienced in the administration of the laws relating to maritime affairs, and its unanimous conclusions carry weight on the matters of which the convention treats. The American delegates, who took an active part in the framing of every article and regulation of the convention, are agreed that the international standards for the safety of life at sea thus proposed to be established are higher than those of any nation now in force, and that the ratification of the convention will secure benefits for humanity by the joint action of maritime nations which could not be accomplished by any one nation, however powerful upon the sea. There are probably points in detail in which the convention may be criticized, especially by particular interests, but in its entirety it is high testimony to the will and ability of nations to put aside special and local considerations in order to promote the progress and welfare of mankind. By its terms the ratifications shall be deposited not later than December 31, 1914. Early and favorable action, accordingly, is recommended.

The convention was ratified by the German Reichstag in May, and the British Parliament in August passed the legislation to give effect to the convention. The Senate, I trust, will see its way clear to the unqualified ratification of the convention before December 31, 1914, for the United States should not be laggard in the prosecution of a work in behalf of humanity, in the inception of which our country had so large a share. The report of the commissioners of the United States to the conference was transmitted to the Senate on March 20, and explains in ample detail the provisions of the convention.

International Conference.

The International Conference for the Unification of Maritime Law, which was to have taken place this autumn at Brussels, was indefinitely postponed on account of the European war. The reappropriation of \$5,000 which Congress had made for American representation at this conference, accordingly, will not be used. The International Load Line Conference, which was to have taken place at London, has also been postponed, but the preliminary work for this conference on the part of Great Britain has not been discontinued, and the conference will be called at a suitable date. In view of the very large increase in ocean cargo steamers under the American flag, I deem it desirable that provision in due time should be made by Congress for American representation at this conference.

CONCLUSION.

A great deal is said in public discussion about extravagance in the expenditure of public moneys and the need for economy is repeatedly urged. Attention is directed usually to the mere total of appropriations in any one year, which means nothing whatever respecting the economical use of money. If attention were directed not to totals but to the wise use of funds so that the latter should be made to produce the utmost possible service, much would be accomplished that is now hardly suggested or attempted. Every industrial manager knows that economy requires his plant to be kept in the best productive condition. It is not economical, in order to save a total expenditure, to allow the plant to run down and then have to build it up again. This does not save money, but loses it. Economy of this kind is not economy at all. It merely involves a cycle of expensive changes, costly in themselves and more costly in their results. If, instead of arguing upon totals, without regard to whether the money which comprises those totals has been spent wisely or unwisely, care were centered on the need for expenditure and for the wisdom with which that need is met, money could be saved that will otherwise continue to be lost.

There are several distinct causes of loss of money to the Government to which but little attention seems to have been paid in public discussion of Government expenditure. One of these causes of loss arises from the failure to keep existing plant in operation to its full capacity. Such a case is that of the Coast and Geodetic Survey steamers laid up idle for part of the year while urgent work is waiting. Money thought to be saved in this way is not saved at all, but wasted.

Another cause of loss is the failure to keep the physical plant of the Government in good repair or to maintain it in effective condition. A case of this kind is found in the three old ships of the Coast and Geodetic Survey, on which an excessive amount of repair cost is required and which even with such outlay are not effective.

Another cause of money loss to the Government arises from incomplete appropriations, for example when funds are appropriated to do half the work required, thus necessitating the stop-

page of that work and causing greater expense from doing that work in several separate bits, with the incidental depreciation of the work already done before the second bite is taken at it. There is no saving in this process.

Another cause of money loss is the making of insufficient appropriations to procure apparatus suited for the work to be done. This arises when the Government is obliged to buy secondhand ships and adapt them to services for which they were not built. A case in point is the steamer *Gannet*, used by the Bureau of Fisheries, built for a private yacht and unfitted for the work she is called upon to do in the waters on the coast of Maine. The people of this country do not realize that the Government is forced to buy secondhand vessels because money sufficient is not given to get new ones, and they would not, in my judgment, were the facts known to them, approve the existing conditions.

Finally, money loss arises from failure to make appropriations in time to keep the work of the Government moving. The serious results of these latter losses are probably not appreciated. They undoubtedly amount to more than some of the economies thought to be effected by clipping estimates. There is no saving whatever but only loss in forcing the purchase of a secondhand vessel and the adapting it to a purpose for which it is not fit, while at the same time causing a cost of more than would build a new vessel by stopping important work for lack of having money in time to keep it going.

The uncertainty whether appropriations for the fiscal year ending June 30, 1915, would be made by or before that year opened caused, for example, the loss of nearly two weeks of the best season at the Beaufort, N. C., laboratory of the Bureau of Fisheries. In other words, the Government investment in this laboratory was idle for that time. The funds for the establishment of the Louisville and Orangeburg fish hatcheries being insufficient to complete their work and new appropriations being deferred, construction of those stations had to be suspended. This meant that the construction cost more to complete than it would have done had the work been carried on continuously and that there was an unavoidable depreciation in what had been done while waiting for further funds.

It has been customary in the fisheries service to send field parties out in June, but this year a number of them could not go until late July or early August. Here was a net loss of about one and

one-half months in time and a loss greater than actually appears, because in many cases time was not sufficient to complete the investigation, which means that the material and equipment must be reassembled next year and traveling expenses again paid to complete problems which under favorable conditions would have been finished in one season.

For research work at the laboratories of the Bureau of Fisheries in Woods Hole, Mass., Beaufort, N. C., and Fairport, Iowa, we depend upon professors from colleges, who are glad to give their services in the summer months for a nominal compensation. They, however, require materials and facilities. This season, by reason of the delay in the appropriations, one of the investigators upon an important problem refused to continue because of the uncertainty, and others have advised the Bureau that if similar conditions continue they will not be able to serve the Government.

In Alaska (see p. 95) it was impossible in 1914 to continue the investigations of the salmon run in Wood River. This run had been counted for several years to determine what proportion of fish in a given stream might be taken without endangering the food supply. It is important to have consecutive annual comparisons of these figures, and a break in the series impairs the value of years of work.

Another serious loss in this connection arises from the fact that all leases (of which the Bureau of Fisheries has some 15) expired on June 30 and could not be renewed during the period before the appropriations became available, and the Government was left to the mercy of the property owners.

The Commissioner of Lighthouses advises me that the delay of appropriations until after the end of the fiscal year operates—seriously to diminish the efficiency of the work, especially in connection with repairs construction, and supplies. The end of the fiscal year falls in the middle of the working season most advantageous for field work in most of the territory covered by the Lighthouse Service. When the appropriations for the following year are not then available except for short periods of time, it is impracticable to plan or carry out the field work in a comprehensive or efficient manner, and some of these necessary repairs involving larger amounts must be entirely deferred. The difficulty of making allotments from the appropriations when extended for brief intervals is seriously increased by the wide distribution of the work of this Service; such allotments must be made to district headquarters in Alaska, the Hawaiian Islands, and Porto Rico, as well as to 16 district offices within the United States. These brief extensions of appropriations also involve a material increase in clerical and accounting work throughout the Service, and they make it impossible to close any of the annual contracts for supplies for the Lighthouse Service.

An example of increased cost due to deferred appropriations occurred at the North Head Light Station, Wash., where the cost

of improving the buildings and grounds was increased approximately \$300, or about 30 per cent of the original estimate. The delay in the appropriation, and consequently in making allotments thereunder, required that this work be carried out at an unfavorable season at an increased expense.

The Director of the Bureau of Standards says respecting these same delays:

There was inconvenience, delay, crowding of work, and consequent loss of efficiency. The delay was mainly in placing orders for apparatus and technical materials, which require a long time for delivery, and also delay in making new scientific appointments which often take several months to secure civil-service lists. Uncertainty as to the granting of new or increased appropriations delays the definite planning of new work.

The Commissioner of Navigation states:

As the legislative bill did not become law until July 16, we were unable to get out allotments to collectors of customs for the hire of motor boats to be used in the enforcement of the navigation laws until after that date, thus losing over two weeks in the height of the motor-boat season. The resolution of Congress giving us one twenty-fourth of the total appropriation of \$20,000 for this purpose did not warrant us in making any allotments.

The urgent deficiency bill, carrying the appropriation of \$15,000 for navigation inspectors to count passengers, did not become law until July 29. From July 1 until about August 1, therefore, we were unable to use these inspectors.

It is not at all my purpose in reviewing the above facts to make a criticism but rather to point out methods of economy that are available if their importance is understood. Causes quite beyond the control of anyone may of course operate to enforce delay, and reasons may exist which are imperative for a procedure which is in itself expensive. It is proper, however, for the information of all who may be concerned that the relations of these things to that efficient administration of the public service which all desire should be made clear.

No sane business man would ever judge of economy or extravagance in expenditure merely by the total. He would ask, "Was the expenditure needed?" "Was the money well spent?" and he would not regard with tolerance or consider economical the mere absence of expenditure, especially when it involved him either in larger future outlay or in greater cost of operation.

Respectfully,

WILLIAM C. REDFIELD,
Secretary.

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ANNUAL REPORT

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ANNUAL REPORT
OF THE
SECRETARY OF COMMERCE

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, October 30, 1915.

To the PRESIDENT:

I have the honor to submit herewith my third annual report, covering the operations and condition of the Department during the fiscal year which ended June 30, 1915, and tracing in a general way its history to the first of October, 1915.

Organization of Department.

The organization of the Department was changed during the fiscal year by the creation of the Federal Trade Commission, into which the Bureau of Corporations was merged on March 16, 1915. The eight bureaus which composed the Department at the close of the fiscal year were those of Foreign and Domestic Commerce, Standards, Census, Fisheries, Lighthouses, Coast and Geodetic Survey, Steamboat-Inspection Service, and Navigation. To these should be added the Office of the Secretary, consisting of five divisions, namely, Office of the Chief Clerk (including the Division of Supplies), Disbursing Office, Appointment Division, Division of Publications, and the Office of the Solicitor.

Injustice to Traveling Employees.

At the very outset, and to call special attention to them, let me outline certain salient matters arising from the year's work. I put in the forefront an injustice which requires remedy. Need exists for undoing a wrong now inflicted by law upon some of the officers of the Department. Your attention, and that of Congress, has been directed before to the fact that the legal limitation of \$5 per diem for all subsistence expenses when traveling upon Government business operates to require public officers to pay at times a considerable portion of their expenses out of their own pockets, although incurred for Government purposes. This

may at times be negligible though wrong in principle, but in the case of subordinates whose duty requires them to travel under conditions where subsistence can not be had within the legal limitations the law operates to work a serious reduction of salary, which is a grave injustice. To be specific, Steamboat-Inspection Service employees must at certain seasons travel constantly in Alaska, else their work would not be done and they would not earn their pay. It is not possible for them to travel within the \$5 per diem limit allowed for subsistence. They receive from \$1,200 to \$2,000 per annum salary. The result, therefore, in the case of Jerome A. Desio, clerk to local inspectors, St. Michael, Alaska, was to deduct \$58.91 from his salary of \$118 for the month of July, 1914. In the case of Mr. Thomas E. Kell, local inspector of steamboats, St. Michael, Alaska, there was deducted from his salary for a like reason during July, August, September, and October, 1914, the sum of \$70.32. In the case of Mr. Thomas P. Deering, local inspector of steamboats, St. Michael, Alaska, for July and August, 1914, there was deducted \$70.35.

Fur wardens in the Alaska Service of this Department, whose duties require constant travel, receive salaries of \$900 per annum. The requirement of law that these employees, out of their own salaries, help pay for subsistence expenses which they unavoidably incur solely on United States Government business works a wrong. From the account of Mr. William P. Hemenway, one of these fur wardens, for expenses during January, 1915, \$12.50 was deducted. These were expenses properly payable by the Government but which could not be allowed because of the law. This same law also works a hardship upon the representatives of this Government traveling in South America, Europe, Asia, and Africa engaged in trade-promotion work. Their duties require that they have intercourse with merchants, importers, exporters, diplomatic and consular representatives of foreign countries. Considering charges in hotels of reasonable comfort in some foreign countries, their work can not be well done without adding out of their own pockets to the amount allowed by law for subsistence. In the case of one agent in Brazil, \$41.91 was deducted to cover excess over the \$5 per day limit charged in his voucher for November and December, 1914, and January, February, and March, 1915. In the case of another agent traveling in Brazil and Uruguay, \$182.58 was deducted to cover excess over the \$5 limit charged in his voucher for November and December, 1914, and January, February, and March, 1915. Another agent traveli- Peru, and

Panama was required to pay \$101.01 out of his own pocket to cover subsistence during April, May, and June, 1915.

I cite here only isolated cases. Most of the agents of the Department, knowing the legal limitation, do not even claim the full amount of subsistence expended by them. This matter was placed before the Appropriations Committee of both the House and the Senate, and the actual bills of fare of Alaskan restaurants were shown to the committees as evidence that the outlay for subsistence by employees in Alaska is unavoidable. The request, however, that the Secretary be given the right to regulate within fixed limits the allowance for subsistence in cases of this kind was refused and the injustice continues. The people of the United States do not desire to take petty advantage of their faithful servants, and I call attention to the facts that this matter may again be brought before Congress. Neither an extravagant nor unlimited allowance for subsistence is desired. Regulations existing before the enactment of the law were so framed that employees were compelled to make their subsistence charges reasonable, and, if proper discretion is given, such regulations will be made as will assure to the Government protection against extravagance, with full publicity, and to traveling employees reimbursement for every proper and necessary expense incurred when traveling in the discharge of their official duties.

Quarters for Federal Trade Commission.

An earnest request was made of the last Congress, both by the Federal Trade Commission and the Department of Commerce, that the former be allowed a sum for renting separate quarters. This was denied, and it was required that the Federal Trade Commission be accommodated within the Commerce Building. It was plainly stated by me to the proper committee that this would result in seriously hampering both the work of the Department and that of the Commission. The result then foreseen has followed. By squeezing an additional force into a space already restricted it has been physically possible to confine temporarily the force of the Federal Trade Commission within the limits of the Commerce Building. This required crowding employees in certain rooms, although an inspector of the Public Health Service had previously reported on inspection of the building that some rooms were overcrowded. The result has been to hamper the work of the Bureau of the Census at a time when the census of manufactures was actively proceeding, to forbid to several bureaus the normal

expansion of space their growing work requires, and to provide the Federal Trade Commission with quarters insufficient for its work and so scattered as to be ineffective in operation. The Director of the Census, pointing out that the Federal Trade Commission occupies an important space in the Commerce Building, adds that the lack of suitable office accommodations has been a serious obstacle to the successful conduct of his work. He has been obliged to assign employees to rooms used for storage purposes, which made it impracticable to bring them under proper administrative control and to utilize them to the best advantage. The present arrangement is unsatisfactory, forcing three important services to work expensively and without proper effectiveness. On April 7, 1915, the Chief of the Bureau of Foreign and Domestic Commerce formally reported that "the Bureau has not sufficient floor space on which to properly conduct its work," and that several of the divisions of that service had to be shifted to relieve congestion.

Congress should provide funds promptly for the rental of quarters for the Federal Trade Commission in order that the space it now occupies may be made available for the employees of this Department. If this is not done, it will seriously overcrowd the building, will bring about insanitary conditions in the housing of the employees both in the Department and in the Federal Trade Commission, and will continue to restrict and make more costly the operations of both. Money supposed to be saved in such a way is wasted.

Attendance of Government Officials at Trade Conventions and Meetings.

In the District of Columbia appropriation act approved June 26, 1912 (37 Stat., 184), it is provided:

SEC. 8. No money appropriated by this or any other Act shall be expended for membership fees or dues of any officer or employee of the United States or of the District of Columbia in any society or association or for expenses of attendance of any person at any meeting or convention of members of any society or association, unless such fees, dues, or expenses are authorized to be paid by specific appropriations for such purposes or are provided for in express terms in some general appropriation.

This law had its origin in the fact that certain public officers had attended political conventions at the public cost. The remedy sought by the law is too sweeping and works evil. It operates to cripple the work of the Bureau of Foreign and Domestic Commerce and other important services of this Department. Under our duty to promote commerce we gather from all

over the world important facts which it is necessary our merchants and manufacturers should have laid before them. The law puts us, however, in the absurd position that having gotten this knowledge for the use of the business world we are not permitted at public cost to go before any gathering or convention of any business or trade organization to tell them what we have learned in their behalf. It is also necessary that the scientific officers of the Bureau of Fisheries and other services should go before State and national societies interested in their work and inform them concerning it. This is a public function generally considered as of great value. Both of these duties, and others like them, can now be carried out only when other circumstances happen to permit the more or less accidental presence of our officers at the place where the gathering is held before which they desire to place information. To quote from my last report:

It surely was not the intention that the law should prohibit the commercial representatives of the country from making known directly to business organizations the information which they have traveled far and labored hard to get, yet this is the effect of the restriction embodied in the law.

It is absurd that an officer of the United States, having gathered at public cost valuable information for the benefit of manufacturers all over the land, should not be permitted to lay those facts before a convention of such manufacturers except at his own personal expense or when some other reason for his presence can be contrived.

Costly Naval Crews.

The steamers *Albatross* and *Fish Hawk*, of the Fisheries Service, are operated by naval crews commanded by warrant officers of the Navy under the direction of a civil officer of the Bureau of Fisheries. The crew of the *Albatross* numbers 81 officers and men and that of the *Fish Hawk* 44 officers and men. A more expensive arrangement than this could hardly be devised. The vessels are admirably handled, but if they had civilian crews, like the other ships of the Department, there would be an immediate and considerable saving to the Government, and the Navy crews with their officers would be restored to the naval service, where they are needed. These two vessels, operated on a civilian basis like our others, would require, in the case of the *Albatross*, 35 officers and men, instead of 81, and in the case of the *Fish Hawk* 26 officers and men, instead of 44 as at present. The naval appropriation would be unchanged, for these men now on the pay roll of the Navy would

be transferred to their normal work in that department. The appropriation of the Department of Commerce would have to be increased to cover the expense of the civilian crews. Taking into consideration the subsistence allowance in the Navy, the reduction of the cost of operating the vessels would be over \$27,000 per annum, while the Navy Department would have restored to its service officers and enlisted men whom it requires. The Secretary of the Navy approves the change and a request to that effect will be made of Congress.

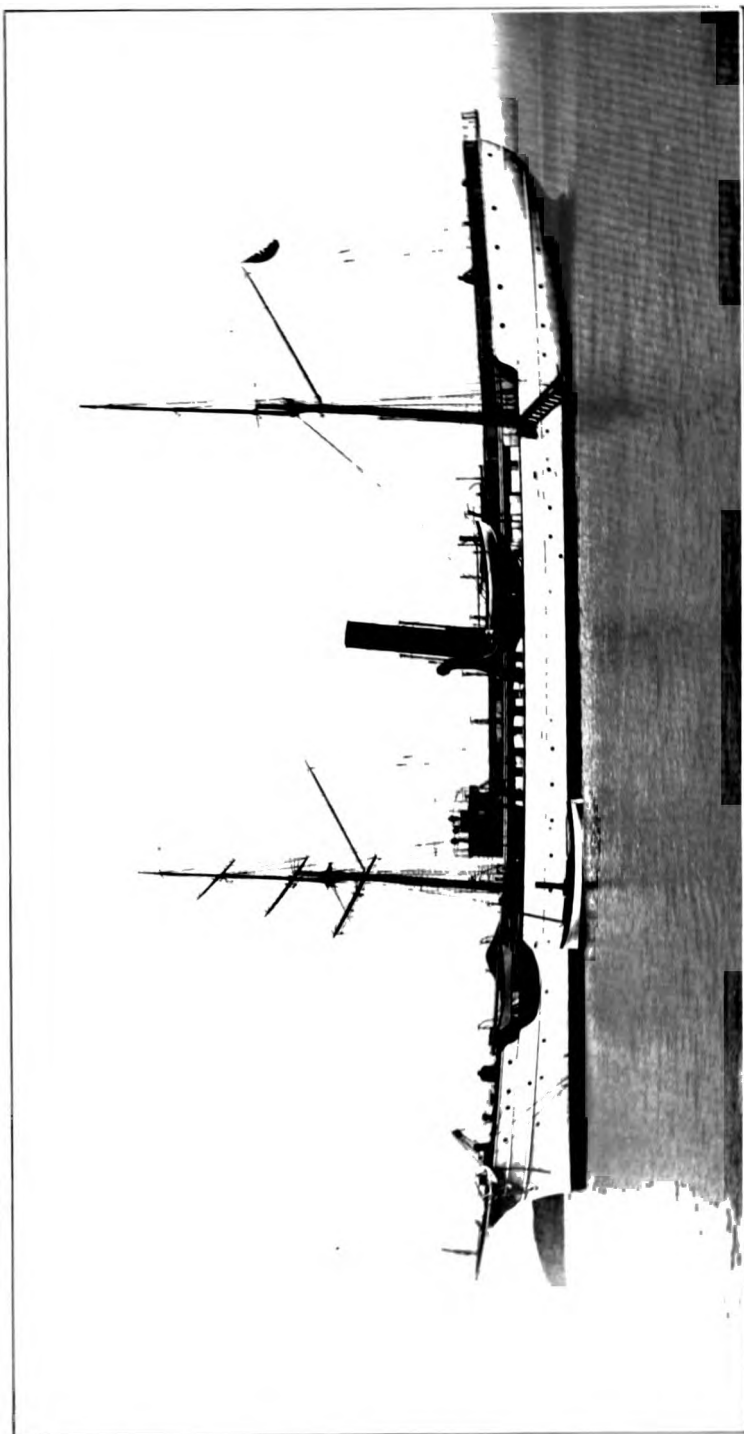
Vessels Idle for Lack of Funds.

Quite as important, or more so, is the fact that because of lack of funds the steamer *Albatross*, with her naval crew under full pay, lay for *nine and a half months* idle at Alameda, Cal. There was no money to pay for coal and other needed operating expenses, while important work, long promised and urgently required and which large sections of our public on the Pacific coast await with impatience, was left undone. For the same reason, the schooner *Grampus* was also idle for seven months with important work waiting to be done. Both the *Albatross* and the *Grampus* face the same prospect during the present fiscal year. Both were specially built for the work they are not now permitted fully to do.

It is imperatively necessary that there be a substantial increase in the appropriation for the maintenance of vessels of the Fisheries Service, unless it is to be the deliberate policy of the Government that these vessels shall remain idle when important work which immediately affects our food supply waits to be done. The sum of \$15,000 (fuel, \$12,000; maintenance, \$3,000) would have kept the *Albatross* in operation on useful work during a time when the pay of the naval crew and other permanent charges against the vessel exceeded \$30,000. Congress was requested to provide \$80,000 for the maintenance of the fisheries vessels. It did provide \$60,000. An emergency arose requiring the presence of the *Albatross* at the Pribilof Islands during the early weeks of the fiscal year, and the appropriation was so limited that she had to lie idle for almost the entire balance of the year while her crew were under full pay.

New and Old Ships.

The wise provision by Congress of funds for the marine services of the Department has borne marked fruit. The lighthouse tender *Cedar*, which will be the largest and most efficient vessel in the



BUREAU OF FISHERIES STEAMER "ALBATROSS."

This vessel, the most perfectly equipped for its use, lay idle 9½ months with crew under full pay for lack of appropriation for coal and supplies while urgent work affecting large Pacific coast interests was waiting to be done.

~~REPORT~~ ~~IN~~ ~~REPLY~~ ~~TO~~ ~~THE~~ ~~COMMISSION~~

[illegible][illegible][illegible]

These three vessels—the *Seam*, the *Seam*, and the *Seam*—each the best of its kind will serve the Northwest and will provide for those vessels their respective services hereafter.

The motor vessel *Luna* has been purchased for the service of the Bureau of Navigation and has been assigned to the

REPORT OF THE SECRETARY OF COMMERCE.

in active work. The fine seagoing steamer *Isis* has been purchased for the Atlantic offshore service of the Coast and Geodetic Survey and is in service. She replaces the feeble and worn-out *Endeavor*, which was described in my last report. The small lighthouse tender *Fern*, for use in Alaska, has been accepted. The small lighthouse tender *Laurel* has been completed and put in service in the shallow waters of our middle Atlantic coast. The contract has been awarded for the construction of the lighthouse tender *Rose*, for use on the coasts of Oregon and Washington. Contract has been awarded for building the tender *Palmetto* at Jacksonville, Fla. A study is being made for a new lightship for Nanucket Shoals, for which funds are available. Plans are preparing for the *Halcyon*, a new vessel for the Bureau of Fisheries. This by no means completes the list of added vessels, for details of which reference is made to the reports of the respective services. The Department had the following vessels in its marine services on October 1, 1915:

	In operation.	Being built.	Total.
Coast and Geodetic Survey.....	12	1	13
Bureau of Navigation.....	2		2
Bureau of Lighthouses:			
Tenders.....	47	3	50
Light vessels.....	65	2	67
Bureau of Fisheries.....	10	1	11
Total.....	136	7	143

This is exclusive of 4 vessels loaned to the Coast and Geodetic Survey by the Philippine Government and of 44 motor boats of all sizes operated by the Bureau of Fisheries.

The "Eastland" Disaster.

The deplorable accident to the steamer *Eastland*, though it occurred on July 24 after the close of the fiscal year, brought the work of the Steamboat-Inspection Service prominently before the public. The inquiry required by law (sec. 4450, Rev. Stat.), which promptly followed at the hands of the local board of inspectors of Milwaukee, was assisted by an unofficial board of inquiry comprising Hon. Barrett O'Hara, lieutenant governor of Illinois; Mr. H. A. Wheeler, Mr. Marvin B. Pool, both of Chicago; Mr. Philip B. Fouke, of St. Louis, chairman of the committee on the Steamboat-Inspection Service of the Chamber of Commerce of the United States; Naval Constructor James L. Ackerson, and Mr.

E. C. Gillette, superintendent of marine construction, United States Lighthouse Service. The inquiry took place under the direction of Mr. A. L. Thurman, Solicitor of the Department of Commerce, and myself. The board of inquiry at its adjournment, taken pending the action of the Federal grand jury, unanimously concurred in a statement which is printed herein under the caption of the Steamboat-Inspection Service. Notice is given it here to emphasize the importance of the recommendation that this Service be placed upon a scientific as well as upon a practical basis through the establishment of the board of naval architects for which the statement calls. This is a remedial measure of the highest value which would provide a technical marine inspection, heretofore impossible, for which neither force nor funds have been provided but which would safeguard at the source, so to speak, all parties in interest in our merchant-marine service as is not now practicable.

I here emphasize the fact that the Steamboat-Inspection Service is at many points both undermanned and overworked. On December 3, 1914, in my address before the New York Maritime Exchange, this was clearly stated. It is due to the public and to the Service that these words then used be reprinted here:

Should some day an accident occur because there was not time for the searching study at which we aim or because an exhausted inspector passed something over, we will deal firmly with it, but the responsibility will not in the last analysis rest with us but with those who provide and with those who can move the providers to provide.

Deficiencies of Motor-Boat Laws.

In two previous reports and again herein the dangers arising under the present motor-boat laws are plainly stated. For the sake of emphasis, and that this Department may not be justly charged with failing to make the facts plainly known, the following words, twice heretofore published, are repeated:

The Department, however, has no direct power over a motor vessel either as regards passengers or machinery. It can inspect the hull, tanks, and piping, but only when the vessel is of 15 tons measurement or more, and when it carries passengers or freight for hire. If, for example, the motor vessel is a private vessel of over 15 tons measurement, the Department can not inspect her in any way. Even if she is a towing motor vessel of this size, there exists no lawful power to inspect her.

The Department can not limit the number of passengers carried for hire on a motor vessel, however big, except by fixing the life-saving equipment. Over motor vessels smaller than 15 tons the powers of the Department are limited to seeing them provided with the necessary life-saving equipment, lights, life preservers, and means of extinguishing gasoline fires. Here the present powers of the Government stop.

I wish to make this perfectly plain. If a Government inspector stands upon a dock watching a motor boat sail away with three times as many passengers as she ought to have and her machinery defective and her hull leaking, he would have no

power in the premises, were she a motor boat under 15 tons measurement, except to see that there was a life preserver in good order provided for every passenger on board, that she had the proper lights and the proper means of extinguishing gasoline fires, with a whistle and a bell of standard dimensions. He could, indeed, require such a vessel to have a licensed operator, but for that license no examination is required. * * * At present a person may obtain a license as operator of motor vessels without being a citizen of the United States or without being 21 years of age, and while being unable to read or write. Under the law, licenses to operators of motor boats are issued without any examination whatever. The inspectors of the inspection service are without authority to ask whether the person applying for such motor-boat license is color blind or whether he understands or can read the pilot rules. Yet such persons, having a license so obtained, may, and in fact do, take charge of motor vessels carrying passengers for hire. Operators of motor boats should be required to show that they are not color blind and have good vision, that they can read the pilot rules and laws, and that they have a reasonable knowledge of them. The existing conditions are a menace to the lives of innocent and unsuspecting passengers and should not be permitted to continue.

Here and now for the **THIRD TIME** the Department makes these facts clear and asks the authority, which it now lacks, to ~~protect~~ the lives of innocent passengers. If that authority is not furnished, the responsibility for the loss of life which is certain to happen will not rest upon the Department. Fortunately, as is explained under the heading of the Navigation Service herein, men with vision connected with motor-boat interests are appreciating the dangers of the existing conditions and are united with the Department in favoring the legislation which is described and which will be submitted to Congress at its next session.

Expansion in Foreign Trade.

As this is written the balance of trade in favor of the United States on merchandise transactions for the nine months elapsed of the current calendar year is in excess of twelve hundred million dollars, a fact not only unprecedented but of profound import alike to America and Europe. We are now the greatest creditor nation, and the balance is likely to grow in our favor as the crops are shipped. The world of international finance is stirred to find new methods of providing the necessary credits which shall cover the vast sums due to us. It is, of course, true that this condition brings with it problems and even dangers, yet it is equally true that it brings opportunities if we have the vision and the courage to seize them.

Alone of all the great industrial nations we are at peace. We alone have in full measure and undisturbed by war's alarms the plants, the labor, and the means to supply the wants of mankind. The nations turn to us. The report of the Chief of the Bureau of

Foreign and Domestic Commerce shows with clearness the extraordinary expansion of his service and the opportunity that awaits it. I deem it of national importance that this Bureau, which shows such practical and tangible results of its activity, shall be supported with the men and the money necessary to carry on its great work in behalf of American commerce effectively and widely. I purpose to ask from Congress an enlarged appropriation for this important work, which is so directly profitable and in which the merchant and the laborer, the manufacturer and the transporter, have a deep and common interest. I shall therefore ask that the force of commercial attachés be increased from 10 to 20, that increased sums be provided for the traveling commercial agents, and that the clerical staff be sufficiently enlarged to cope with the volume of work our growing foreign business thrusts upon it and under which it is to-day seriously overburdened. When a service can point to orders in excess of a million dollars each, given to our industries as the direct results of its activities, it is entitled to the best of support.

Government-Owned Building for the Department.

The lease at \$17,500 per annum for the addition to the Commerce Building, which was constructed that we might accommodate the Bureau of the Census under the same roof with the other bureaus of the Department occupying rented quarters, was made on July 1, 1914, and terminates on August 31, 1918, the date on which the lease for the original Commerce Building expires. The total saving resulting from moving the Bureau of the Census into the Commerce Building has been during the fiscal year just ended \$24,580, a sum slightly larger than was expected.

The act of May 30, 1908 (35 Stat., 545), authorized and directed the Secretary of the Treasury to acquire land for the use and accommodation of the Departments of State, Justice, and Commerce and Labor, and the Secretary of the Treasury has done so. The act of June 25, 1910 (36 Stat., 698), authorized and directed the Secretary of the Treasury to prepare designs and estimates for a separate fireproof building for each of the Departments of State, Justice, and Commerce and Labor, to be erected upon the land acquired under the act of May 30, 1908 (*supra*), at a cost not to exceed \$8,000,000. On March 3, 1913, the plans for the proposed building for the Department of *Commerce and Labor* were approved by my predecessor. These plans did not provide for the accom-

modation of the Bureau of Fisheries or the Coast and Geodetic Survey in the proposed new building. In view of the fact, however, that four bureaus which were to be housed in the proposed new building have been transferred to the Department of Labor and another bureau to the Federal Trade Commission, I am confident that the plans can be so revised that the building can accommodate the Coast and Geodetic Survey and the administrative offices of the Bureau of Fisheries.

As the lease for the Commerce Building, which the Department now occupies, will expire within three years, it will be necessary to proceed promptly in the matter of providing the new Government building for this Department if it is to be ready for occupancy by that time. The construction of such a building is urged not only in the interest of efficiency and good administration but also in the interest of economy. At the present time the Department is paying \$65,500 for the rental of the enlarged building, which, although not unreasonable when compared with other rental rates in the District of Columbia, represents an income of 3 per cent on \$2,183,333.

In my last annual report I pointed out the desirability of having the bureaus of this Department, except the Bureau of Standards, housed in one Government building. The experience gained by having five of our bureaus housed in the same building with the divisions of my own immediate office accentuates the loss of money and effectiveness in having the Bureau of Fisheries and the Coast and Geodetic Survey separated from the rest of the Department. It is never good business practice to scatter a department through several buildings located in different parts of the city. This is a cause of hourly waste, a producer of delays, and a creator of inefficiency. If poverty compels such a wasteful course to be pursued, it should at least be accepted only as a temporary makeshift which common sense would end as soon as money could be found. Under the headings of the respective services I speak in detail of the buildings which now confine rather than contain both. I renew my protest against the policy of paying rent to private parties for buildings for the public service, especially when this requires the work of a department to be split into parts at enhanced cost for operation.

Modern Aquarium for the Bureau of Fisheries.

The fishing industry throughout the land, whether on river, lake, or ocean, the interest of science sta... w to maintain and enlarge the supplies of foo... provide, the

interest of those who fish for sport the country over, would all be enhanced by providing a modern aquarium for the Bureau of Fisheries, suited alike for the scientific work of the Bureau and for those scientists who collaborate with it for the development of the fishing industry, and for the education of the public. This aquarium should be housed in a separate building located as nearly as practicable to the proposed new building for the Department. The public interest in such an aquarium appears in the throngs that have visited the exhibit of the Bureau of Fisheries at the Panama-Pacific International Exposition at San Francisco and in the number of visitors at the small temporary aquariums of the Fisheries Service in Washington and in Woods Hole, Mass.

The aquarium, however, would not be primarily to furnish amusement or to provide a place of pleasant public resort. These are incidental uses which because of their educational value are important. The aquarium would be useful chiefly as a working tool to provide new sources of food supply and to improve those already existing. It is a singular thing that so practical a people as we talk so much about the cost of living and do so little about it. There are huge quantities and a large variety of unused fish foods of excellent quality of which we hardly know. An acre of water on a farm is equal to an acre of good land in food-producing value. We wisely establish agricultural experiment stations, but why stop there? It is quite as possible to improve the breed of fishes in size and in food value as it is to develop plants in like characteristics. What is true of plant life, of cattle and horses as regards improving their quality and number, is just as true of fish, and the infinite variety of fish far surpasses that of all other animals put together.

Three things are possible by the use of such an aquarium which without it are either impracticable or at best will be long delayed. These are (1) new sources of food supplies; (2) the improvement of the food supplies now existing; and (3) the enlargement of the present supply.

The aquarium, therefore, would serve as an experiment laboratory or station used for the public good, similar to the use made of the agricultural experiment stations. It would be for the benefit of the farmer, because it would make possible the extension of the service now directed to him, providing fish food supplies in small ponds on the farms. It would be an aid to the dweller in the city, because it would enlarge the fish food supply now within his reach and provide new ones. Thus it would be of universal

value, not local, certainly not a mere matter of providing the seeker of pleasure with means of pleasure, but a practical service to many. A bill will be introduced, with the approval of the Department of Commerce, asking the authorization of such an aquarium-laboratory at the next session of Congress.

At a time when the high cost of living is a matter of keen public interest, the Bureau of Fisheries has caused to be placed in the public markets wholly new supplies of food, cheap and valuable, and can cause others to be so placed. It should receive the fullest practicable encouragement respecting an aquarium, not as a means of display but as a working tool through whose use may come practical benefits.

Miscellaneous.

The Department has a 1,500-pound capacity gasoline truck in operation carrying mail between the post office, the Commerce Building, the Bureau of Fisheries, and the Coast and Geodetic Survey, and making miscellaneous trips. The service has fully justified the appropriations which permit the purchase of motor-propelled vehicles to replace horse-drawn vehicles. The truck has run 10,954 miles during the year, averaging 38.3 miles for each operating day, and making approximately 12.5 miles on each gallon of gasoline used. The total cost of maintaining the truck a year amounted to \$486.42—less than 4½ cents per mile. This is an excellent showing, especially when it is considered that three horses, three wagons, and an electric truck were formerly used to do the work which is now being done by this truck.

The Department also uses a 2,000-pound capacity gasoline truck for hauling supplies between the Commerce Building, the Bureau of Fisheries, the Coast and Geodetic Survey, and the freight depots. Although this truck was not bought until November 10, 1914, it has covered 4,444 miles, averaging 22.64 miles each day, running approximately 10 miles per gallon of gasoline.

The purchase of these automobile trucks enabled the Department to reduce its stable equipment by four horses and four wagons and to dispose of the worn-out electric truck formerly used by the Bureau of the Census. The Department therefore changed its stable quarters, so saving \$800 in annual rent. The cost of maintaining the stable during the year (exclusive of rent) was reduced \$1,442.21. In addition two employees were withdrawn from the stable force and assigned to other duties.

The work of the consolidated library in the Commerce Building has progressed steadily during the year. There are about

100,000 volumes in the library; 2,570 volumes were added during the year. One thousand and thirty-one weekly and monthly periodicals are currently received, 997 of which are received in exchange for the Department's publications. During the year 9,723 duplicates were disposed of and 821 volumes were sent to the Government Printing Office for binding and rebinding. The classification used in the Library of Congress has been adopted.

The Department purchased during the year 161 typewriters, 85 for use in the District of Columbia and 76 for the outside service. The total cost was \$10,770.96. The allowance for old machines given in exchange was \$2,807.50, making an outlay for new machines of \$7,963.46, an average price of \$49.46 paid for each machine.

An interesting feature of the year was the presentation of a gold watch and chain to Capt. Paul H. Kreibohm, and gold, silver, and bronze medals to the officers and crew of the American steamer *Kroonland* for rescuing 89 people from the burning steamer *Volturmo* in the North Atlantic Ocean during October, 1913.

With the \$55,625 allotted to it by the Government Exhibit Board, this Department has been able to make exhibits at the Panama-Pacific International Exposition at San Francisco, Cal., illustrating the work of the following Bureaus: Census, Foreign and Domestic Commerce, Standards, Fisheries, Lighthouses, Coast and Geodetic Survey, and Navigation. The exhibits of the Department were awarded 5 grand prizes, 4 gold medals, 3 silver medals, 12 medals of honor, and were honorably mentioned once. The representatives of the Department were awarded silver medals as collaborators.

Appropriations and Expenditures.

The itemized statement of the disbursements from the contingent fund of the Department of Commerce and the appropriation for "General expenses, Bureau of Standards," for the fiscal year ended June 30, 1915, required to be submitted to Congress by section 193 of the Revised Statutes of the United States, the itemized statement of expenditures under all appropriations for propagation of food fishes during the fiscal year ended June 30, 1915, required by the act of Congress approved March 3, 1887 (24 Stat., 523), and a statement showing travel on official business by officers and employees (other than the special agents, inspectors, and employees in the discharge of their regular duties, who are required to travel constantly) from Washington to points outside of the Dis-

trict of Columbia during the fiscal year ended June 30, 1915, as required by the act of Congress approved May 22, 1908 (35 Stat., 244), will be transmitted to Congress in the usual form.

The following table shows the total amounts of all appropriations for the various bureaus and services of the Department of Commerce for the fiscal year ended June 30, 1915:

Bureau.	Legislative act.	Sundry civil act.	Deficiency act.	Special acts.	Total.
Office of the Secretary.....	\$ 876,244.17		\$8,025.82		\$878,269.99
Bureau of Corporations.....	\$ 251,300.00				251,300.00
Bureau of Lighthouses.....	64,050.00	\$5,223,600.00	252,965.72	\$5,688.40	5,546,924.12
Bureau of the Census.....	1,538,346.67		246.87		1,538,593.54
Bureau of Foreign and Domestic Commerce.....	396,989.59				396,989.59
Steamboat-Inspection Service.....	532,998.33		22.66		533,020.99
Bureau of Navigation.....	172,030.00		15,000.00	6,088.79	193,118.79
Bureau of Standards.....	623,393.33	65,000.00	28.55		688,421.88
Bureau of Fisheries.....		1,088,471.66	50,050.89		1,138,522.55
Coast and Geodetic Survey.....		1,039,278.34	5.42		1,039,283.76
Total.....	3,855,352.09	7,416,350.00	380,343.93	11,977.19	11,664,023.21
Allotment for printing and binding.....		\$ 400,000.00			\$ 400,000.00
Grand total.....		7,816,350.00			12,064,023.21

* Of this amount, \$2,206.29 was transferred to the Federal Trade Commission.

† Of this amount, \$87,512.49 was transferred to the Federal Trade Commission.

‡ Of this amount, \$12,386.76 was transferred to the Federal Trade Commission.

The disbursements by the Disbursing Clerk of the Department of Commerce during the fiscal year ended June 30, 1915, arranged according to items of appropriation, are as follows:

OFFICE OF THE SECRETARY.

Salaries, Office of the Secretary of Commerce, 1914.....	\$6,145.80
Salaries, Office of the Secretary of Commerce, 1915.....	144,398.13
Contingent expenses, Department of Commerce, 1913.....	63.89
Contingent expenses, Department of Commerce, 1914.....	23,542.26
Contingent expenses, Department of Commerce, 1915.....	70,735.55
Rent, Department of Commerce, 1914.....	4,150.00
Rent, Department of Commerce, 1915.....	60,991.63
Total.....	310,027.26

BUREAU OF CORPORATIONS.

Salaries, Bureau of Corporations, 1914.....	3,150.12
Salaries, Bureau of Corporations, 1915.....	54,562.55
Salaries and expenses, special attorneys, Bureau of Corporations, 1914..	10,067.86
Salaries and expenses, special attorneys, Bureau of Corporations, 1915..	109,291.94
Total.....	177,072.47

BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

Salaries, Bureau of Foreign and Domestic Commerce, 1914.....	\$4,233.07
Salaries, Bureau of Foreign and Domestic Commerce, 1915.....	113,516.64
Promoting commerce, Department of Commerce, 1913.....	.44
Promoting commerce, Department of Commerce, 1914.....	4,356.96
Promoting commerce, Department of Commerce, 1915.....	51,724.13
Collating tariffs of foreign countries, 1914.....	553.79
Collating tariffs of foreign countries, 1915.....	404.16
Investigating cost of production, Department of Commerce, 1914.....	3,778.28
Investigating cost of production, Department of Commerce, 1915.....	43,785.86
Promoting commerce, South and Central America, 1915.....	13,303.35
Commercial attachés, Department of Commerce, 1915.....	18,652.73
Total.....	<u>254,309.41</u>

BUREAU OF STANDARDS.

Salaries, Bureau of Standards, 1914.....	11,595.03
Salaries, Bureau of Standards, 1915.....	266,464.68
Laboratory, Bureau of Standards.....	77.64
Equipment, Bureau of Standards, 1913.....	570.27
Equipment, Bureau of Standards, 1914.....	3,192.24
Equipment, Bureau of Standards, 1915.....	38,183.90
General expenses, Bureau of Standards, 1913.....	40.39
General expenses, Bureau of Standards, 1914.....	4,080.89
General expenses, Bureau of Standards, 1915.....	19,729.65
Testing machines, Bureau of Standards, 1913.....	2.10
Testing machines, Bureau of Standards, 1914.....	5,556.71
Testing machines, Bureau of Standards, 1915.....	28,319.35
Testing structural materials, Bureau of Standards, 1914.....	3,521.58
Testing structural materials, Bureau of Standards, 1915.....	84,586.48
Refrigeration constants, Bureau of Standards, 1913.....	317.72
Refrigeration constants, Bureau of Standards, 1914.....	3,166.98
Refrigeration constants, Bureau of Standards, 1915.....	13,996.45
Investigating effects of electric currents, Bureau of Standards, 1913....	1.40
Chemical laboratory, Bureau of Standards.....	2,375.00
Current meter testing tank, Bureau of Standards, 1913.....	32.93
Electrical laboratory equipment, Bureau of Standards, 1913-14.....	18.28
Workshop and storehouse, Bureau of Standards.....	24,957.45
Improvement and care of grounds, Bureau of Standards, 1914.....	109.26
Improvement and care of grounds, Bureau of Standards, 1915.....	5,641.94
High-potential investigations, Bureau of Standards, 1914.....	1,389.67
High-potential investigations, Bureau of Standards, 1915.....	13,218.51
Testing railroad scales, Bureau of Standards, 1914.....	3,742.23
Testing railroad scales, Bureau of Standards, 1915.....	17,444.47
Investigation of fire-resisting properties, Bureau of Standards, 1914....	13,858.04
Investigation of fire-resisting properties, Bureau of Standards, 1915....	15,683.85
Testing miscellaneous materials, Bureau of Standards, 1915.....	18,764.61
Investigation of railway materials, Bureau of Standards, 1915.....	10,425.00
Investigation of public-utility standards, Bureau of Standards, 1915..	16,698.66
Total.....	<u>627,763.30</u>

STEAMBOAT-INSPECTION SERVICE.

Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1914.....	\$610. 03
Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1915.....	14, 783. 94
Salaries, Steamboat-Inspection Service, 1914.....	28, 477. 02
Salaries, Steamboat-Inspection Service, 1915.....	322, 304. 92
Clerk hire, Steamboat-Inspection Service, 1914.....	6, 903. 42
Clerk hire, Steamboat-Inspection Service, 1915.....	76, 907. 32
Contingent expenses, Steamboat-Inspection Service, 1913.....	25. 08
Contingent expenses, Steamboat-Inspection Service, 1914.....	15, 538. 92
Contingent expenses, Steamboat-Inspection Service, 1915.....	64, 175. 90
Steamboat-Inspection Service, Los Angeles, Cal., 1914.....	616. 77
Total.....	<u>530, 343. 32</u>

BUREAU OF NAVIGATION.

Salaries, Bureau of Navigation, 1914.....	1, 386. 71
Salaries, Bureau of Navigation, 1915.....	30, 351. 72
Salaries, Shipping Service, 1914.....	2, 399. 52
Salaries, Shipping Service, 1915.....	27, 578. 06
Clerk hire, Shipping Service, 1914.....	2, 918. 02
Clerk hire, Shipping Service, 1915.....	32, 241. 97
Contingent expenses, Shipping Service, 1914.....	3, 728. 56
Contingent expenses, Shipping Service, 1915.....	1, 900. 13
Enforcement of wireless-communication laws, 1913.....	300. 38
Enforcement of wireless-communication laws, 1914.....	2, 321. 62
Enforcement of wireless-communication laws, 1915.....	40, 544. 94
Enforcement of navigation laws, 1914.....	1, 127. 42
Enforcement of navigation laws, 1915.....	19, 080. 30
Admeasurement of vessels, 1914.....	304. 76
Admeasurement of vessels, 1915.....	2, 289. 14
Preventing overcrowding of passenger vessels, 1915.....	8, 069. 48
Instruments for counting passengers, 1915.....	216. 92
Watch and medals for officers and crew of American steamer <i>Kroonland</i>	494. 85
Total.....	<u>177, 255. 40</u>

BUREAU OF FISHERIES.

Salaries, Bureau of Fisheries, 1914.....	26, 648. 96
Salaries, Bureau of Fisheries, 1915.....	337, 684. 42
Miscellaneous expenses, Bureau of Fisheries, 1913.....	68. 16
Miscellaneous expenses, Bureau of Fisheries, 1914.....	37, 746. 02
Miscellaneous expenses, Bureau of Fisheries, 1915.....	395, 848. 68
Protecting seal and salmon fisheries of Alaska, 1913.....	50. 15
Protecting seal and salmon fisheries of Alaska, 1914.....	2, 870. 92
Protecting seal and salmon fisheries of Alaska, 1914-15.....	45, 543. 11
Protecting seal and salmon fisheries of Alaska, 1915.....	41, 975. 71
Payment to Great Britain and Japan.....	20, 000. 00
Launch for fish hatcheries, Mississippi Valley.....	35. 43
Vessels and boats, Alaska fishery service, 1915.....	43, 263. 62
Marine biological station, North Carolina, 1915.....	4, 864. 64
Vessels, fish hatchery, Boothbay Harbor, Me., 1915-16.....	66. 16
Philippine fisheries report.....	10. 06

Fish hatcheries:

Cape Vincent, N. Y.....	\$5. 63
Clackamas, Oreg.....	7. 85
Edenton, N. C., 1915.....	7. 47
Kentucky.....	1, 495. 93
Puget Sound, Wash.....	3, 697. 37
South Carolina.....	1, 478. 66
Upper Mississippi Valley.....	7, 897. 25
Washington.....	911. 10
Woods Hole, Mass.....	42. 62
Wyoming.....	8, 975. 91
Total.....	961, 195. 83

BUREAU OF THE CENSUS.

Salaries, Bureau of the Census, 1914.....	24, 222. 67
Salaries, Bureau of the Census, 1915.....	646, 182. 01
Collecting statistics, Bureau of the Census, 1913.....	. 20
Collecting statistics, Bureau of the Census, 1914.....	21, 497. 20
Collecting statistics, Bureau of the Census, 1915.....	772, 437. 47
Tabulating machines, Bureau of the Census, 1914.....	912. 49
Tabulating machines, Bureau of the Census, 1915.....	11, 468. 23
Rent, Bureau of the Census, 1914.....	1, 752. 00
Total.....	1, 463, 472. 27

BUREAU OF LIGHTHOUSES.

Salaries, Bureau of Lighthouses, 1914.....	2, 772. 48
Salaries, Bureau of Lighthouses, 1915.....	60, 428. 79
General expenses, Lighthouse Service, 1913.....	998. 52
General expenses, Lighthouse Service, 1914.....	23, 244. 94
General expenses, Lighthouse Service, 1915.....	35, 598. 77
Salaries, Lighthouse Service, 1914.....	272. 00
Salaries, Lighthouse Service, 1915.....	7, 195. 08
Salaries, lighthouse vessels, 1915.....	300. 00
Aids to navigation, Alaska.....	29. 07
Cape Cod Canal lights, Mass.....	39. 57
Cape Fear River lights, N. C.....	11. 42
Fort McHenry Channel range lights, Md.....	19, 589. 04
Brandywine Shoal Light Station, Del.....	27, 942. 00
Cape St. Elias Light Station, Alaska.....	4, 126. 27
Thimble Shoal Light Station, Va.....	38. 071. 92
Tender for first lighthouse district.....	37, 651. 88
Tender for fifteenth lighthouse district.....	17, 604. 44
Tender for engineer sixth lighthouse district.....	455. 07
Lighthouse tender, general service.....	652. 80
Frigate Albatross Light Vessel, Lake Erie.....	9, 777. 84
Light vessels for general service.....	25, 886. 03
Tug for sixth lighthouse district.....	62, 000. 00
Southwest Pass Light Vessel, Mississippi River, La.....	1, 465. 59
Aids to navigation, Ashtabula Harbor, Ohio.....	7. 00
Total.....	214, 915. 82
Grand total.....	4, 914, 253. 08

The following statement shows the expenditures during the fiscal year ended June 30, 1915, on account of all appropriations under the control of the Department, giving the total amounts disbursed by the various disbursing officers of the Department and miscellaneous receipts for the same period:

By the Disbursing Clerk, Department of Commerce, on account of salaries and expenses of the Office of the Secretary of Commerce, the Bureaus of Corporations, Foreign and Domestic Commerce, Navigation, Standards, Fisheries, and Lighthouses, the Office of the Supervising Inspector General, Steamboat-Inspection Service, salaries and expenses of Steamboat-Inspection Service at large, and public works of the Lighthouse and Fisheries Services (shown in detail in the foregoing table of disbursements).....	\$4,916,353.08
By the authorized disbursing officers of the Lighthouse Service.....	5,101,416.67
By the special disbursing agent, Coast and Geodetic Survey, on account of salaries and expenses of the Coast and Geodetic Survey.....	1,037,605.33
By the commercial agents of the Department investigating trade conditions abroad, as special disbursing agents.....	104,512.82
By special disbursing agents, Bureau of Fisheries.....	24,443.51
By warrants drawn on the Treasurer of the United States to satisfy account settled by the Auditor for the State and Other Departments, classified as follows:	
Office of the Secretary.....	\$2,196.82
Foreign and Domestic Commerce.....	1,615.25
Bureau of Standards.....	2,656.47
Steamboat-Inspection Service.....	39.42
Bureau of Navigation.....	6,416.36
Bureau of the Census.....	5,337.65
Bureau of Fisheries.....	5,395.93
Coast and Geodetic Survey.....	28,320.10
Bureau of Lighthouses.....	113,544.85
	<hr/> 165,432.85
Printing and binding.....	399,999.47
Total.....	<hr/> <hr/> 11,749,763.73

MISCELLANEOUS RECEIPTS, FISCAL YEAR 1915.

Coast and Geodetic Survey: Sale of charts, publications, old property, etc.....	\$16,841.16
Bureau of Standards:	
Sale of Government property.....	\$81.12
Standardizing and testing weights.....	14,355.62
	<hr/> 14,436.74
Steamboat-Inspection Service: Sale of condemned property, etc.....	113.50
Bureau of the Census: Sale of publications, etc.....	313.00
Bureau of Lighthouses: Sale of public property, rentals, etc.....	19,178.59
Office of the Secretary: Sale of condemned property, etc.....	2,342.59
Bureau of Navigation:	
Sale of public property.....	\$21.95
Annual yacht tax.....	37,976.30
Tonnage tax.....	1,315,425.30
Navigation fines.....	41,518.24
Navigation fees.....	142,446.37
Deceased passengers.....	240.00
	<hr/> 1,537,628.16

Bureau of Fisheries:

Sale of condemned property, etc.....	\$3,785.87	
Sale of 9 pairs breeding foxes.....	1,838.00	
Property sold, Pribilof Islands, Alaska.....	6,533.33	\$12,157.20

Total..... 1,603,010.94

The following unexpended balances of appropriations were turned into the surplus fund June 30, 1915, in accordance with the act of June 20, 1874 (18 Stat., 110-111):

Salaries, Office of Secretary of Commerce and Labor, 1913.....	\$5,990.46
Rent, Department of Commerce and Labor, 1913.....	998.00
Contingent expenses, Department of Commerce and Labor, 1913.....	143.10
Salaries, Bureau of the Census, 1913.....	19,733.11
Expenses of the Thirteenth Census, 1913.....	2,590.62
Temporary clerks, Bureau of the Census, 1913.....	3,805.34
Collecting statistics, Bureau of the Census, 1913.....	872.95
Cotton statistics, Bureau of the Census, 1913.....	1,453.33
Tobacco statistics, Bureau of the Census, 1913.....	.17
Rent, Bureau of the Census, 1913.....	1,080.00
Tabulating machines, Bureau of the Census, 1913.....	106.78
Salaries, Bureau of Foreign and Domestic Commerce, 1913.....	274.97
Salaries, Bureau of Manufactures, 1913.....	198.95
Salaries, Bureau of Statistics, 1913.....	244.23
Collecting statistics relating to commerce, 1913.....	54.45
Collating tariffs of foreign countries, 1913.....	20.25
Promoting commerce, Department of Commerce and Labor, 1913.....	1,837.12
Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1913.....	69.44
Salaries, Steamboat-Inspection Service, 1913.....	1,649.72
Clerk hire, Steamboat-Inspection Service, 1913.....	1,284.11
Contingent expenses, Steamboat-Inspection Service, 1913.....	5,345.68
Salaries, Bureau of Navigation, 1913.....	521.81
Salaries, Shipping Service, 1913.....	2,977.84
Clerk hire, Shipping Service, 1913.....	1,536.03
Contingent expenses, Shipping Service, 1913.....	9.28
Instruments for measuring vessels and counting passengers, 1913.....	2.63
Enforcement of navigation laws, 1913.....	882.44
Enforcement of wireless-communication laws, 1913.....	252.25
Salaries, Bureau of Standards, 1913.....	14,099.71
Equipment, Bureau of Standards, 1913.....	967.44
General expenses, Bureau of Standards, 1913.....	422.97
Improvement and care of grounds, Bureau of Standards, 1913.....	13.19
Current meter testing tank, Bureau of Standards, 1913.....	3.02
Investigating effects of electric currents, Bureau of Standards, 1913.....	75.97
Refrigeration constants, Bureau of Standards, 1913.....	116.32
Testing machines, Bureau of Standards, 1913.....	161.32
Testing structural materials, Bureau of Standards, 1913.....	297.22
Salaries, Coast and Geodetic Survey, 1913.....	6,132.86
Party expenses, Coast and Geodetic Survey, 1913.....	6,409.08
General expenses, Coast and Geodetic Survey, 1913.....	451.18
Pay, etc., of officers and men, vessels, Coast Survey, 1913.....	4,864.16
Repairs of vessels, Coast Survey, 1913.....	1,509.45

Repair of steamer <i>Pathfinder</i> . Coast Survey.....	\$288. 16
Salaries Bureau of Lighthouses 1913.....	503. 64
General expenses Lighthouse Service 1913.....	32,728. 14
Salaries keepers of lighthouses 1913.....	21,156. 01
Salaries lighthouse vessels 1913.....	27,326. 42
Salaries Lighthouse Service. 1913.....	17,859. 81
Storehouses for oil.....	10. 98
Monhegan Island Light Station. Me.....	1,822. 43
Point Judith Lighted Buoy. R. I.....	534. 31
Negro Point Light Station. N. Y.....	2,649. 08
Staten Island Lighthouse Depot. N. Y.....	23. 26
Brantwine Shoal Light Station. Del.....	39. 66
Cape Fear River lights. N. C.....	126. 73
Lincoln Rock Light Station. Alaska.....	225. 51
Tender for engineer third lighthouse district.....	272. 15
Salaries Bureau of Fisheries. 1913.....	18,273. 15
Miscellaneous expenses Bureau of Fisheries. 1913.....	8,477. 90
Payments to Great Britain and Japan.....	20,000. 00
Protecting seal fisheries of Alaska.....	240. 41
Protecting seal and salmon fisheries of Alaska. 1913.....	1,893. 14
Protecting the sponge fisheries. 1913.....	3,424. 45
Steamer <i>Thomson</i> . repairs.....	147. 70
Total.....	247,482. 22

Personnel.

During the year the personnel of the Department has been reduced by the transfer of the Bureau of Corporations to form the nucleus of the force of the Federal Trade Commission, authorized by the act approved September 26, 1914. The Commission was formally organized March 16, 1915, on which date the Bureau of Corporations ceased to exist and the following force was transferred:

Statutory:	
Clerical employees.....	56
Subclerical employees.....	5
	<hr/> 61
Nonstatutory:	
Special examiners.....	7
Special attorneys.....	14
Special agents.....	58
	<hr/> 79
Total.....	<hr/> 140

The former Commissioner of Corporations was appointed a member of the Commission.

A permanent addition to the personnel of the Department was made by the appointment of a force of inspectors whose duty is to enforce, under the direction of the Bureau of Navigation, the laws to prevent the overcrowding of passenger and excursion vessels. By legislation enacted July 20, 1914, this work was

transferred from the Treasury Department and during the balance of the fiscal year 1915 had been carried out by a temporary force. In order, however, to select a satisfactory permanent force, examinations were held by the Civil Service Commission and the persons appointed selected from the registers established therefrom. At the end of the fiscal year this force consisted of 43 permanent and 15 temporary inspectors.

The accompanying table shows by bureaus the number of permanent positions in the Department on July 1, 1915, and the increase or decrease in each bureau as compared with July 1, 1914. The figures do not include temporary appointments, nor do they include the following appointments or employments not made by the head of the Department: Persons engaged in rodding, chaining, recording, heliotropeing, etc., in field parties of the Coast and Geodetic Survey; temporary employments in field operations of the Bureau of Fisheries; mechanics, skilled tradesmen, and laborers employed under authority of Schedule A, Subdivision I, section 12, of the civil-service rules in the Lighthouse Service. Enlisted men on vessels of the Coast Survey in the Philippines, paid by the insular government of the Philippine Islands, are also excluded. The total of these excluded miscellaneous employments and enlistments is approximately 6,117. At the close of the fiscal year there were 966 employees in the service of the Department serving under temporary appointment or employment.

Bureau.	Statutory.	Non-statutory.	Total.	In District of Columbia.	Outside District of Columbia.	Increase (+) or decrease (-).
Office of the Secretary.....	162	.....	162	162	.....	+ 36
Bureau of the Census.....	569	710	1,279	^a 608	^b 671	- 98
Bureau of Foreign and Domestic Commerce.....	88	83	171	108	63	+ 51
Bureau of Standards.....	239	145	384	331	53	+ 46
Bureau of Fisheries.....	398	21	419	76	343	+ 22
Bureau of Lighthouses.....	56	5,736	^c 5,792	41	5,751	+1172
Coast and Geodetic Survey.....	255	488	743	^a 271	472	+ 15
Bureau of Navigation.....	37	132	169	30	139	+ 68
Steamboat-Inspection Service.....	201	69	270	10	260	+ 5
Total.....	2,005	7,384	9,389	1,637	7,752	^d +317

^a Employees engaged in work in the field for a part of each year, with headquarters in Washington, are treated as within the District of Columbia.

^b Does not include 634 temporary special agents, employed in connection with the census of manufactures, on duty at the close of June 30, 1915.

^c Includes the following positions, appointment to which is not made by the head of the Department: 603 (392 classified competitive and 211 classified excepted) mechanics, skilled tradesmen, and laborers employed in field construction work in the Lighthouse Service and work of a similar character at the general lighthouse depot at Tompkinsville, N. Y.; 1,546 (unclassified) laborers in charge of post lights; and 1,181 (unclassified) members of crews of vessels.

^d Not including the loss of 142 positions by reason of transfer of the Bureau of Corporations to the Federal Trade Commission.

The following table gives a summary of the changes in the personnel of the Department during the fiscal year ended June 30, 1915:

APPOINTMENTS, PROMOTIONS, AND REDUCTIONS.

Bureau.	Appointments. ^a						Promo- tions.	Reduc- tions.
	Permanent.				Tempo- rary.	Grand total.		
	Com- peti- tive.	Ex- cepted.	Un- clas- sified.	Total.				
Office of the Secretary.....	33	.....	15	48	7	55	12	.....
Bureau of the Census.....	49	.....	205	254	1,361	1,615	114	3
Bureau of Corporations ^b	8	8	.....	16	1	17	44	.....
Bureau of Foreign and Domestic Commerce.....	36	56	2	94	61	155	68	11
Bureau of Standards.....	81	.....	2	83	29	112	112	1
Bureau of Fisheries.....	36	8	23	67	13	80	38	6
Bureau of Lighthouses.....	236	42	1	279	91	370	345	96
Coast and Geodetic Survey.....	37	11	3	51	27	78	79	2
Bureau of Navigation.....	57	5	1	63	59	122	12	.....
Steamboat-Inspection Service.....	13	.....	.....	13	6	19	14	4
Total.....	586	130	252	968	1,655	2,623	838	123

SEPARATIONS AND MISCELLANEOUS CHANGES.

Bureau.	Separations. ^c					Grand total.	Miscellaneous changes. ^d
	From permanent positions.				From temporary positions.		
	Competitive.	Ex-cepted.	Unclas-sified.	Total.			
Office of the Secretary.....	26	.....	8	34	6	40	15
Bureau of the Census.....	73	.....	228	301	770	1,071	82
Bureau of Corporations ^b	5	1	1	7	.....	7	.....
Bureau of Foreign and Domestic Com- merce.....	9	22	2	33	57	90	143
Bureau of Standards.....	37	.....	3	40	25	65	37
Bureau of Fisheries.....	34	8	22	64	19	83	27
Bureau of Lighthouses.....	228	28	.....	256	97	353	93
Coast and Geodetic Survey.....	34	5	3	42	19	61	26
Bureau of Navigation.....	12	5	.....	17	53	70	18
Steamboat-Inspection Service.....	15	.....	.....	15	6	21	4
Total.....	473	69	267	809	1,052	1,861	445

^a Includes appointments of the following character: Presidential, by selection from civil-service certificates, under Executive order, to excepted positions, by reinstatement, and by reason of transfer within the Department or from other departments or independent establishments.

^b The Bureau of Corporations was abolished Mar. 15, 1915, under the provisions of the act approved Sept. 26, 1914 (Public No. 203), and the personnel thereof was transferred to and became a part of the Federal Trade Commission Mar. 16, 1915.

^c Includes separations by reason of resignations, discontinuances, removals, deaths, transfers within the Department, and transfers from the Department to other departments or independent establishments.

^d Includes reappointments by reason of change of station, name, designation, or appropriation, extensions of temporary appointments, changes from temporary to permanent status, etc.

During the fiscal year 1915 the following presidential appointments were made:

Position.	Compensation.	Authority.
Director of the Census ^a	\$6,000	32 Stat., 51.
Chief of Bureau of Foreign and Domestic Commerce ^b	6,000	Acts Aug. 23, 1912, and July 16, 1914.
(First) Assistant Chief of Bureau of Foreign and Domestic Commerce. ^c	3,500	Do.
(Second) Assistant Chief of Bureau of Foreign and Domestic Commerce. ^d	3,000	Do.
Deputy Commissioner, in the Bureau of Fisheries ^e	3,500	32 Stat., 1102.
Superintendent of the Coast and Geodetic Survey ^f	6,000	25 Stat., 949.

^a Appointment confirmed by the Senate Mar. 3, 1915, and appointee commissioned Mar. 5, 1915, effective Mar. 16, 1915.

^b Appointment confirmed by the Senate Oct. 1, 1914, and appointee commissioned Oct. 7, 1914, effective Oct. 5, 1914.

^c Appointment confirmed by the Senate July 29, 1914, and appointee commissioned July 31, 1914, effective on July 31, 1914, by promotion from (Second) Assistant Chief of Bureau of Foreign and Domestic Commerce.

^d Appointment confirmed by the Senate July 30, 1914, and appointee commissioned Aug. 5, 1914, effective Aug. 5, 1914. Filled by promotion of classified competitive employee in the same Bureau.

^e Commissioned under a recess appointment Mar. 11, 1915, effective Apr. 15, 1915. Filled by promotion of classified competitive employee in the same Bureau.

^f Commissioned under a recess appointment Mar. 11, 1915, effective Apr. 15, 1915. Filled by promotion and transfer of a presidential appointee from another bureau.

The Department's policy of filling vacancies by promotion, so far as practicable, instead of by transfer from other departments is proving an incentive to increased efficiency. Promotion within the Department inspires the working force with the sense that their interests are considered and each employee knows that by faithful service he will win a fair chance at such opportunity as may arise. It is the aim of the Department to admit employees to the lower grades and to advance them according to the results produced. In bureaus where scientific and technical qualifications are required it is impossible to lay down an arbitrary rule, but it is recognized by officers and employees of the Department that this definite policy exists and that only special circumstances will warrant action to a contrary effect.

On September 21, 1915, at the request of the Public Health Service, a statement was prepared showing the total and average amount of *sick* leave taken during the calendar year 1914 by employees of the Department in the District of Columbia, arranged according to sex. This statement showed the following facts:

	Male.	Female.	All employees.
Total number of employees.....	1,115	331	1,446
Total number of days taken.....	5,509	3,273.5	8,782.5
Average number of days taken per employee.....	4.94	9.89	6.07

A statement was also prepared, from data already available, showing the total and average amount of *annual* and *sick* leave, stated separately and together, taken during the calendar year 1914 by employees of the Department in the District of Columbia, arranged according to sex. This statement shows the facts to be as follows:

	Male.	Female.	All employees.
Total number of employees.....	1, 115	331	1, 446
Total number of days taken:			
Annual.....	30, 927	9, 701	40, 628
Sick.....	5, 509	3, 273. 5	8, 782. 5
Average number of days taken per employee:			
Annual.....	27. 74	29. 31	28. 10
Sick.....	4. 94	9. 89	6. 07

In view of the importance of securing, for the field work of the Bureau of Foreign and Domestic Commerce, persons possessing suitable qualifications for the positions of commercial and special agent, which are exempt from the competitive requirements of the civil-service rules and regulations, the Department has deemed it advisable to recognize the advantages of an appropriate examination test and has adopted the policy that selection for such appointments shall be made only after the person selected has fully demonstrated the possession of the exceptional qualifications needed. These examinations are conducted under the joint supervision of the Civil Service Commission and the Department.

The Department has endeavored, so far as is possible without manifest detriment to the service, to protect the aged employee. There have, however, been occasional necessary reductions and dismissals of superannuated Government employees. Meanwhile action on the question of providing for the retirement of superannuated clerks has not made apparent advance with those by whom the matter must ultimately be settled. Separations from the service of such employees by death, resignation, and from other causes are of frequent occurrence, but the superannuated employee is still found on the pay roll. The removal of such from the list of active employees would add to the average product of the remaining employees, would give young, ambitious, and deserving employees greater opportunity for advancement, and would generally improve the value of the Government clerk and the tone of the service.

The act of January 16, 1883, provides that appointments to the civil service of the Government shall be apportioned among the several States and Territories according to population "so far as may be consistent with the interests of the service." This may be construed as authorizing departure from the apportionment principle when it is manifest that by doing so a better result is to be had. While of late years the Civil Service Commission has made modifications in the order of certifying eligibles which show marked progress toward greater efficiency, they have shown hesitation about utilizing the latitude allowed by the law by deviating from the apportionment principle when manifestly such action would be justified. To illustrate the disadvantages of the policy in force, highly efficient candidates from Maryland, Virginia, and the District of Columbia are practically excluded from consideration for certain positions and are not considered for appointment while those of much lower qualifications are presented for selection. An eligible with a rating of 70 per cent from certain States must be and is considered before an eligible from the States and the District named with a rating of 95 per cent. Again, the policy which prevents the promotion of the messenger boys to clerical grades deprives the Government of the services of those who have served apprenticeship and who in consequence must prove of greater value to the service than those without that experience.

Printing and Binding.

The Division of Publications is charged with the expenditure of the printing and binding allotment of the Department. This involves conducting the business of the Department with the Government Printing Office, and general supervision over all printing (including editing and preparing copy), illustrating, and binding for the Department, and keeping records of expenditures and liabilities. The Division has in charge also the distribution of publications; the maintenance of mailing lists; the operation of duplicating, addressing, and mailing equipment; the advertising done by the Department; and the correspondence which these duties entail.

The allotment to the Department for printing and binding during the fiscal year 1915 was \$400,000. Of this sum \$399,999.47 was expended, leaving an unused balance on June 30 of 53 cents. The decrease in expenditures in 1915 compared with 1914 was \$10,701.30 (or 2.6 per cent), the allotment in 1914 being \$441,000 and the expenditures \$410,700.77.

The estimated cost of unbilled and uncompleted work of the Department at the Government Printing Office on July 1, 1915, was \$51,948.39.

During the year the Department issued on the Public Printer 3,091 requisitions for printing and binding, compared with 3,084 in 1914, an increase of 7. In 1915, however, requisitions were in many cases consolidated where work was identical in character, which reduced the number of requisitions, saved clerical work in preparation and recording, and reduced the cost of the printing and binding. Of the requisitions issued in 1915 there remained at the close of the fiscal year 436 upon which deliveries of completed work had not been made, compared with 355 in 1914 and 344 in 1913.

The following table shows the cost of printing and binding for each of the bureaus, offices, and services of the Department during the fiscal years 1914 and 1915, together with the increase or decrease for each bureau, office, and service and the estimated cost of the work on hand but not completed June 30, 1915:

Bureau, office, or service.	Cost of work delivered.		Increase (+) or decrease (-).		Estimated cost of work not completed June 30, 1915.
	1914	1915	Cost.	Per cent.	
Office of the Secretary (Secretary, Assistant Secretary, Solicitor, Chief Clerk, and Division of Publications).....	\$12,655.94	\$19,537.58	+ \$6,881.64	+ 54.37	\$2,239.93
Appointment Division.....	383.58	379.22	- 4.36	- 1.14	.....
Disbursing Office.....	698.09	412.18	- 285.91	- 40.96	156.39
Division of Supplies.....	505.43	686.04	+ 180.61	+ 35.73	42.70
Bureau of the Census.....	110,758.32	122,302.82	+ 11,544.50	+ 10.42	11,169.58
Coast and Geodetic Survey.....	28,837.49	26,345.70	- 2,491.79	- 8.64	5,828.05
Bureau of Corporations.....	10,468.46	\$ 17,000.00	.....	.....	.....
Bureau of Fisheries.....	12,687.49	15,916.27	+ 3,228.78	+ 25.45	1,678.14
Bureau of Foreign and Domestic Commerce.....	132,039.55	103,229.74	- 28,810.21	- 21.82	11,257.08
Bureau of Lighthouses.....	25,560.31	24,428.15	- 1,132.16	- 4.43	3,996.32
Lighthouse Service.....	7,298.93	5,853.89	- 1,445.04	- 19.80	1,735.97
Bureau of Navigation.....	12,473.34	14,183.91	+ 1,710.57	+ 13.71	1,558.77
Shipping Service.....	2,646.77	2,272.30	- 374.47	- 14.15	1,251.59
Radio Service.....	893.83	705.67	- 188.16	- 21.05	94.37
Bureau of Standards.....	28,033.31	24,876.38	- 3,156.93	- 11.26	4,312.40
Office of the Supervising Inspector General, Steamboat-Inspection Service.....	2,637.22	2,801.64	+ 164.42	+ 6.23	6.51
Steamboat-Inspection Service.....	8,768.90	9,780.49	+ 1,011.59	+ 11.54	2,731.06
Customs Service.....	13,353.42	9,287.49	- 4,065.92	- 30.45	3,889.53
Total.....	410,700.77	399,999.47	- 10,701.30	- 2.60	51,948.39

* Includes \$4,613.24 expended by the Department and \$12,386.76 transferred to the Federal Trade Commission on Mar. 15, 1915, in accordance with the requirement of the act creating the Commission, approved Sept. 26, 1914.

I again call attention to the fact that though the work of the Department has expanded its expenditures for printing and binding have remained practically stationary, as is shown by the following statement. The figures prior to 1913 include expenditures for bureaus and services transferred to the Department of Labor by the act of March 4, 1913, but do not include those for the Bureau of the Census, which was formerly provided for by separate allotments or appropriations. The insufficiency of the Department's allotment for 1915 is evidenced by the unused balance of only 53 cents, though at the end of the year there was in hand uncompleted work which will cost approximately \$52,000, and which constitutes a liability against the allotment for 1916.

Fiscal year.	Allotment.	Expenditures.	Unused balance.	Cost of work not completed June 30.
1907.....	\$375,000.00	\$332,185.05	\$42,814.95	\$34,749.24
1908.....	375,000.00	342,962.36	32,037.64	47,055.59
1909.....	375,000.00	374,939.91	60.09	29,139.26
1910.....	^a 376,337.43	^a 361,530.43	14,807.00	42,535.93
1911.....	^b 381,500.00	^b 375,575.02	5,924.98	46,173.12
1912.....	375,000.00	374,995.64	4.36	43,956.76
1913.....	^c 329,978.06	^c 329,974.92	3.14	36,686.50
1914.....	441,000.00	410,700.77	30,299.23	49,827.74
1915.....	400,000.00	399,999.47	.53	^d 51,948.39

^a Includes \$1,337.43 expended for supplies furnished the Bureau of the Census, for which the Department's allotment was reimbursed.

^b Includes a special appropriation of \$6,500 for the printing of the World Trade Directory. The entire sum was expended for the publication.

^c Includes \$6,728.06 for printing done for the Bureau of the Census (publishing statistics relating to cotton and tobacco) and the Bureau of Navigation (Radio Service), for which the Department's allotment was reimbursed.

^d Estimated.

The following statement shows the amount and cost of each class of work called for by requisitions on the Public Printer during the fiscal year 1915, and affords a comparison with the amount and cost of these classes during the preceding fiscal year:

Class.	1914	1915	Increase (+) or decrease (-).	
	Number.	Number.	Number.	Per cent.
Blank forms.....	14,301,618	15,559,663	+1,258,045	+ 8.80
Reports, pamphlets, etc.....	7,634,930	3,370,410	-4,264,520	- 55.86
Letterheads.....	1,789,000	3,427,500	+1,638,500	+ 91.59
Envelopes.....	347,250	153,500	- 193,750	- 55.80
Circulars, notices, and summaries.....	729,875	541,200	- 188,675	- 25.85
Index cards.....	1,620,200	1,220,700	- 399,500	- 24.66
Guide cards and folders.....	152,700	411,650	+ 258,950	+169.58
Memorandum sheets.....	1,525,000	5,678,000	+4,153,000	+272.33
Blank books.....	13,355	28,597	+ 15,242	+114.13
Miscellaneous books (binding).....	4,530	3,945	- 585	- 12.91
	Cost.	Cost.	Cost.	Per cent.
Blank forms.....	\$45,226.19	\$51,225.93	+\$5,999.74	+ 13.27
Reports, pamphlets, etc.....	338,247.73	301,666.94	-36,580.79	- 10.81
Letterheads.....	2,962.95	5,364.20	+ 2,401.25	+ 81.04
Envelopes.....	311.61	265.96	- 45.65	- 14.65
Circulars, notices, and summaries.....	3,594.09	2,299.90	- 1,294.19	- 36.01
Index cards.....	1,339.47	1,104.74	- 234.73	- 17.52
Guide cards and folders.....	740.27	1,910.98	+ 1,170.71	+158.15
Memorandum sheets.....	1,214.55	3,275.18	+ 2,060.63	+169.66
Blank books.....	10,591.99	11,296.06	+ 704.07	+ 6.65
Miscellaneous books (binding).....	5,890.27	8,481.08	+ 2,590.81	+ 43.98
Miscellaneous.....	581.65	721.74	+ 140.09	+ 24.08
Transferred to Federal Trade Commission (Bureau of Corporations) on Mar. 15, 1915.....		12,386.76		
Total.....	410,700.77	399,999.47	-10,701.30	- 2.60

^a This decrease was due principally to the reduction of the edition of Commerce Reports on July 1, 1914, from 20,000 to 5,000 daily.

During the fiscal year 1915 the Department issued 1,048 publications, compared with 1,054 for the same bureaus and offices during the fiscal year 1914. The publications issued in 1915 contained a total of 63,851 printed pages, compared with 54,768 in 1914, and there were printed of them for the Department a grand total of 3,777,895 copies, against 8,586,605 in the preceding year, a decrease of 4,808,710 copies. This decrease was due to the smaller editions printed of many of the Department's periodical publications, especially daily Commerce Reports, of which there were 4,180,800 fewer copies printed in 1915 than in 1914.

The publication work of each bureau of the Department for the past two fiscal years is summarized in the following table:

Bureau.	Publications.		Pages.		Copies printed for Department.		Cost.	
	1914	1915	1914	1915	1914	1915	1914	1915
Office of the Secretary....	56	64	2,090	2,237	197,050	157,250	\$6,435.72	\$6,055.39
Bureau of the Census.....	198	138	12,976	19,937	1,056,950	524,625	98,306.41	97,830.49
Coast and Geodetic Survey.....	25	29	4,674	3,197	55,125	55,060	32,782.08	21,630.72
Bureau of Corporations...	15	10	3,136	2,550	16,990	24,100	3,672.45	14,319.65
Bureau of Fisheries.....	53	57	2,516	3,159	90,100	68,200	10,496.77	11,902.88
Bureau of Foreign and Domestic Commerce...	425	494	16,220	18,708	6,242,470	2,108,460	121,820.68	98,937.71
Bureau of Lighthouses...	108	87	3,432	3,548	279,020	258,300	25,791.17	25,188.70
Bureau of Navigation....	19	17	2,036	2,523	42,100	55,900	11,817.41	12,154.79
Bureau of Standards.....	145	137	6,895	6,662	129,300	153,400	19,553.30	19,408.79
Steamboat-Inspection Service.....	10	15	793	1,330	477,900	372,600	7,295.61	8,511.22
Total.....	1,054	1,048	54,768	63,851	8,586,605	3,777,895	\$337,971.60	\$315,904.34

* Figures relate to publications actually delivered to the Department during the year; consequently they do not agree with similar figures in a preceding table giving the cost of work done by the Government Printing Office during the fiscal year. Frequently the cost of a publication is charged against allotments or two or more fiscal years.

During the year 2,523,994 publications and printed circulars of the Department were distributed to the public, as compared with a total of 7,035,029 during the fiscal year 1914, a decrease of 4,511,035. This decrease was due in part to revisions of mailing lists, which resulted in the removal of a large number of names, but chiefly to the Department's effort to curtail the promiscuous free distribution of its publications and to place them on a sales basis. There was a decrease in 1915 compared with 1914 of the daily Commerce Reports (formerly Daily Consular and Trade Reports), which was on July 1, 1914, placed on a subscription basis, of 4,180,800 copies formerly printed for free distribution. Of the total number of publications and circulars distributed in 1915, 2,086,815 were wrapped and mailed by the office of the Superintendent of Documents and 437,179 by the Division of Publications. Those wrapped and mailed by the Superintendent of Documents comprised a mailing-list distribution of 1,860,033 and a distribution in response to individual requests of 226,782.

The Department during the year received and acted on 79,738 miscellaneous requests, calling for 385,208 copies of publications. This was an average of 261 requests and 1,279 publications for each working day.

The number of legal opinions rendered, formal and informal (memorandum), numbered 323. In addition to the above, 1,066 miscellaneous matters, embracing everything submitted for the advice or suggestion of the Solicitor, or for the formulation of departmental action, not included in the foregoing items, were handled by this Office.

This completes the usual report for the Office of the Secretary. Certain important questions of policy remain to be briefly considered before proceeding to discuss the separate services. To these questions I ask special attention.

Foreign Unfair Competition.

"Unfair competition" is forbidden by law in domestic trade, and the Federal Trade Commission exists to determine the facts and take steps to abate the evil wherever found. The door, however, is still open to "unfair competition" from abroad which may seriously affect American industries for the worse. It is not normal competition of which I speak, but abnormal. It is a destructive type of the industrial struggle, intended to put out of being the forces opposed to it that the victor may exploit the field at will. The methods used are not those of legitimate commerce, but those of commercial offense. They aim not at development, but at conquest. When the war shall close, the public control of railways in foreign lands, the semiofficial chambers of commerce, the publicly fostered organizations which control great industries in some countries, will all exist and will all be used in an effort to recover lost commerce. The growth in the United States of industries which may menace large markets heretofore controlled from abroad will not be permitted if public and semipublic forces acting together in foreign countries can prevent it. The outreach of American industries, nay their very existence in our own land in some cases, will be resisted to the full and every stratagem of industrial war will be exerted against them. Expecting this, we must prepare for it. If it shall pass beyond fair competition and exert or seek to exert a monopolistic power over any part of our commerce, we ought to prevent it.

So few would question the duty of restraining by means of the public power the unfair foreign competition of which I speak that the question may be said not to be whether we shall prevent such attacks but how they shall be prevented, while welcoming, indeed promoting, that normal ebb and flow of legitimate commerce

between our land and all others which will provide for our people the security against exaction which is insured by reasonable competition. In my judgment the matter is one which may more wisely be treated as an attempted wrong to be forbidden than as an economic matter which needs to be restrained. I should prefer, therefore, to deal with it by a method other than tariffs, classing it rather as an offense similar to the unfair domestic competition we now forbid. It seems possible that by using the existing machinery of the Treasury Department and the Department of Justice we may restrain this foreign "unfair competition" on both sides of the sea. I recommend, therefore, that such legislation be enacted as will give to the foreign representatives of the above-named departments such added powers and increased personnel as they may need for this purpose, and that it be enacted if possible that merchandise sold in "unfair competition" or under circumstances which tend to create a monopoly in behalf of the foreign producer in American markets shall be forfeited. I also recommend that legislation supplemental to the Clayton Antitrust Act be enacted which shall make it unlawful to sell or purchase articles of foreign origin or manufacture where the prices to be paid are materially below the current rates for such articles in the country of production or from which shipment is made, in case such prices substantially lessen competition on the part of the American producers or tend to create a monopoly in American markets in favor of the foreign producer, and that it be made unlawful for any person to buy, sell, or contract for the sale of articles of foreign origin, or to fix a price for same or to make a rebate upon such price, conditioned upon the purchaser thereof not using or dealing in wares produced or sold by the competitors of the manufacturer or seller, where the effect is to substantially lessen competition in the production in the United States of such articles, or tends to create a monopoly in the sale of such articles in American markets in favor of a foreign producer.

Cooperation in Foreign Trade.

I deem it of special importance that business concerns should be allowed to cooperate in foreign trade. The present law plays into the hands of the larger concerns and shuts out small ones from important markets. It may be said that small manufacturers could not in any case successfully enter the foreign field. This, however, ignores the fact that in many lines and specialties there are producers of moderate size abundantly able to compete as re-

gards the cost and character of their products but unable to assume alone the considerable expenditure over a continued period that would be required to obtain a firm foothold in foreign markets for their somewhat limited products. Such a concern ought to be permitted to cooperate with another in similar or different lines in order to share the expense of introducing their goods abroad. There are lines of industry classified under one head in which the individual concerns may each make separate specialties though their general products are in common. Provision should be made whereby such concerns may, with due safeguards against monopoly, cooperate in the foreign field. To refuse this for any fancied fear of monopoly is to say that the large concerns shall alone hold the lucrative foreign markets and that the far larger number of smaller houses with their many employees shall be shut out from them. Such a policy can commend itself to no one. The whole matter should be placed under the supervision of the Federal Trade Commission and should be subject to full publicity. Either of these safeguards should be sufficient; both of them will certainly be so. It is, of course, not intended that this cooperation shall extend into the domestic field. It is as necessary that it shall exist as regards the foreign field as it is important that it should not go to excess in the domestic one. One should be done; the other avoided. Under the supervision of the Federal Trade Commission the necessary good can be accomplished and the unnecessary evil can be prevented.

Cooperation in Establishing Banks Abroad.

It is important that our banks should be permitted to cooperate, subject to the supervision of the Federal Reserve Board, in establishing foreign branches or in owning stocks of banks operating in foreign countries. The present law operates to make it possible only for large banks of great power to undertake the important work of financing American commerce in foreign fields. In other words, the law works in sole favor of the great banks. Great credit is due those American bankers who have taken the first forward steps in establishing foreign branches. They are true pioneers of American commerce abroad. The work, however, is of such national importance that it should not be confined to any one or any few large institutions. It is not for their permanent good that it should be so confined. The country requires not one or a few, but numerous American-owned banks abroad. There are many banks in the United States of less size, yet

abundantly strong. These should be permitted, under proper safeguards, to act jointly in such matters. There could hardly be a single step in the fiscal world which at this time would be more helpful in establishing our commerce abroad on a firm basis. Several strong institutions have signified willingness to cooperate in establishing foreign banks if permission is given them by the law.

This can not be done too soon. Time presses. The hour for movement is now. The currents of the world's trade flow strongly toward America. They may not always so flow. There are those whose interest it will not be to have them flow our way. This is not the occasion for fear lest something happen somewhere and somehow which will not be pleasing to some one, but is the time for action, taking, indeed, every possible thoughtful step to safeguard that action, but remembering that action is the thing needed.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

The former chief of this Bureau, Mr. A. H. Baldwin, resigned, effective on October 4, 1914, to accept the post of commercial attaché at London. Dr. Edward Ewing Pratt was appointed Chief of the Bureau as his successor and took office on October 5, 1914. He found the work of the service established on a solid foundation, upon which is building a structure of great and growing usefulness to the commerce of the United States.

The work of the Bureau of Foreign and Domestic Commerce is necessarily of a missionary character. It partakes of the nature of a commercial reconnoissance. It often precedes the efforts of the regular salesman. Nevertheless, it must be tested by its practical value and can not be called promoting commerce unless actual orders result. While, therefore, it would be a mistake to measure the work wholly by the volume of orders known to have been taken by American manufacturers in a given time as a result of its work, this, nevertheless, is the standard of success toward which we must work and by which, in some measure at least, that work must be tested. When a large foreign order is laid upon the Secretary's desk as a result of the work of the service, when a foreign buyer intending to spend a considerable sum in the United States is, through the work of the service, led to buy twice as many American goods as he had expected to purchase, we think we may justly feel that these are practical evidences of what the business man calls "results." Within a few days of the end of the past fiscal year a representative of a Russian house applied to the Bureau of Foreign and Domestic Commerce to assist him in getting in touch with concerns interested in exporting cotton. Through a confidential circular his presence in New York City was made known, and during a short stay in New York the visitor made his headquarters at the office of our service there and formed connections with American exporters. One of these latter tells us that he has just closed with the party named a five-year contract for 40,000 bales of cotton annually.

We are also informed of several specific instances of large orders, some for a million dollars or more, the information of which was first published in our "Foreign trade opportunities" service. Among these are a railway for the island of Formosa, a capitol at Tai-hoku, Formosa, and arsenal machinery at Shanghai, China. We

were recently informed by a large milling concern in the West that about two years ago it formed a business connection with a concern in Turkey through the Bureau and that during the past two years the amount of business done by the American house with this one concern has exceeded \$800,000.

Information published as a "Foreign trade opportunity" resulted in a contract for a new telephone system for a city in northern Europe, a contract for a petroleum pipe line in southeastern Europe, and a contract for a public building in the Far East. It would be easy to multiply instances showing the direct results of the effective service of the Bureau, for whose better equipment Congress so wisely provided at its last session.

One single result of the work of a commercial attaché in Europe would many times pay the cost of the entire attaché service for years through the opening of a market for several million tons of American coal annually. Within three hours after we learned from abroad that through the agency of our attaché the door for exporting coal to Spain was open telegrams giving this information were sent by the Bureau to the most important coal producers in the United States, and within three days a letter was received from prominent American coal producers saying they had already gotten into cable communication with their representatives in Madrid and had a cable order for a considerable quantity of coal.

It is so natural and proper a question as to whether the forward step taken by this service with the approval of Congress in the last year has had practical results that I venture to offer certain correspondence, of which it would be easy to produce many other examples.

The following is from a large machinery manufacturing house:

We have wanted to express to you and the Department at Washington our ideas about the Bureau, and have omitted from doing so because of our hours being too much occupied.

Allow us to thank you for putting us in touch with at least five countries, where we have appointed agents, or had important correspondence, all through the Bureau with little or no cost to us, and also with other concerns which may bring business to a head later on, because our service takes some time to market.

To-day we are working on a cable order, which was started entirely through the "Trade opportunity" system, and which cost us approximately 25 cents postage and a few cables.

Some time ago the writer had the pleasure of talking to a subject of Great Britain who has had a vast experience in foreign commerce, and his words were: "There's no use talking, we are behind the times when it comes to consular service; you Americans have the most efficient system in the world."

We therefore wish to extend our thanks to the Bureau, and beg to state that we appreciate the courtesy afforded us by its New York office.

The letter which follows is from the commercial agent in charge of the St. Louis office of the service:

In conversation the other day with ———, representing ———, he stated that through a firm in Italy whose name was obtained through a "Foreign trade opportunity" announcement a few years ago, the company had secured a customer who, up to the beginning of the war, had been purchasing between \$50,000 and \$75,000 worth of shoes annually. It was stated, however, that owing to the unsettled conditions in Italy, business with the firm referred to is practically at a standstill at the present time.

This company follows up the "Foreign trade opportunity" service in a very methodical manner. It does not expect to receive an order from every firm mentioned in the "opportunity." It has been found that the first letter written to many firms is ignored entirely. After sufficient time has elapsed for a reply to be received, the original letter is followed up by another communication, and if no attention is taken of the second letter the name is filed and in six or nine months or a year the correspondence is again revived and a catalogue sent. It is believed that this systematic method of following up the service has had much to do with the satisfactory results obtained.

The following is from a well-known manufacturer in the State of Ohio:

We are pleased to inform you that we are in receipt of another order from Halifax, which was in answer to your "Foreign trade opportunities." This makes the fourth order we have received from this party, and we feel that we are indebted to your Department for the original order.

In the letter which follows the commercial agent in charge of the New York office advises concerning foreign orders obtained through the "Foreign trade opportunity" service:

advises that through a name and address connected with a "Foreign trade opportunity" announcement, published about three months ago, they have secured an order for ten safes. * * * The order comes from Maracaibo, and the cash payment is in New York, the safes to be shipped on the next Red D Line boat. The company in Maracaibo has taken the agency for the safes, and it is expected that good business will result.

Mr. ——— states that he has secured business sooner or later from about 50 per cent of the inquiries received through the Daily Consular and Trade Reports. He is doing business with a concern in India which amounts to about \$5,000 a month. This connection was made through the "opportunity" service. He is also getting connections in China River, which were made in the same manner.

The letter which follows, addressed to the office of the Bureau in Atlanta, Ga., is from a hosiery manufacturer in the State of Tennessee:

We wish to make mention of one success, which we have achieved through the use of your "Trade opportunities." Just yesterday we received an order for about 2,000 dozen from an agent in Santo Domingo, whom we obtained through the use of your "Trade opportunities."

We have also disposed of quite a little of our merchandise to other firms by this same means, and we wish to say that your services have been a material aid to us in building up our foreign business, and you may rest assured that we value it most highly.

The following is from the general manager of one of the leading coal-mining companies, written from its New York office:

Your letter of April 26, conveying to us for our confidential information and use the substance of certain parts of a report on the private audience which Commercial Attaché C. W. A. Veditz, with the American Ambassador to Madrid, had with the King of Spain, received, and we appreciate your consideration very much. * * * I am sure you will be pleased to know that we are interesting the consumers of coal in Spain in the purchase of our product.

Acting upon your previous advices, we cabled the Minister of State, Madrid, of our desire to establish relations with the Spanish Government and Spanish commercial coal consumers, and promptly received a reply by cable, advising us of certain coal consumers being in the market for a supply of coal, and after some cable correspondence with these consumers *we got a very good order from them*, which we are now filling. Meantime, we are negotiating further sales and hope to be as successful as we were in the first instance.

The letter printed below is from a manufacturing house in Chicago:

We just delivered to a Russian house \$2,500 worth of merchandise, and it cost us only 7 cents to get the order, as name was given us by you some time ago. Thank you.

It is a pleasure to know that the merchants and manufacturers of the country are appreciative of the service. They show it in a way which is often pleasantly embarrassing, through calling on us for more and more of that which we would willingly give if we had the force and funds to do so.

It is now the definite policy of the Bureau of Foreign and Domestic Commerce to place in touch with every delegation and official commercial visitor from abroad an officer of the Department speaking the language of the country from which the delegation or visitor comes, in order to assist as fully as possible in developing American commerce from the visit. As an official illustration of the value of this work, the following correspondence with the commissioner of the Spanish Government to develop commerce between Spain and the United States of America may have interest:

NEW YORK, June 7, 1915.

SECRETARY OF COMMERCE, Washington, D. C.

DEAR SIR: The writer, who intends to sail for Spain on board the Spanish steamship *Manuel Calvo* to-morrow, wishes to express to you, before leaving the United States, my appreciation of assistance rendered me during my sojourn in the United States by the Bureau of Foreign and Domestic Commerce, both in New York and at Washington.

May I ask that you extend my thanks and appreciation of their courtesy and kindness which was shown me to Dr. E. E. Pratt, Mr. E. C. Porter, and Mr. Rose, of the New York bureau, who, on account of his speaking our language fluently, was of very great assistance to me.

I take the liberty at this time to compliment you on the efficiency of these departments, without the assistance of which it would have been very difficult for me to fulfill my duties as commissioner of my Government.

If it be possible, I would thank you to send me the data which is issued from time to time by your Department relative to the commerce between Spain and the United States.

My address in Madrid is Juan de Mena No. 23, and I assure you that I will be very happy to have the pleasure of greeting you in our country at some future time.

Looking forward to that pleasure, and again thanking you, I am

Yours, very truly,

JOSE DE GOROSTIZAGA.

JUNE 8, 1915.

MY DEAR SIR: Your valued favor of the 7th is received by me to-day, and I regret that it does not give me time to send this to you before you leave the country.

I appreciate for myself and for my associates your thoughtful courtesy in writing so kindly your appreciation of their assistance. I assure you on their behalf that they were more than glad to be of service to you and will continue so to be. I trust, therefore, you will feel free to lay before them through me any further problems or suggestions that may from time to time occur to you. It is my earnest desire to cultivate and improve the relations between your country and our own, seconding in this respect the very courteous expression of His Majesty, your King, kindly communicated by him to our Ambassador and Commercial Attaché Dr. C. W. A. Veditz. I hope it may be your privilege to meet from time to time Dr. Veditz, the commercial attaché, to whom I refer. A letter addressed to him care of the American Embassy at Paris will reach him. He visits Spain from time to time and can there be addressed care of our Embassy at Madrid. He would be glad to be of service to you, and possibly as matters arise you could save time by communicating with him.

The Bureau of Foreign and Domestic Commerce has been instructed to put your name upon their mailing list, that you may be sent the data which they publish. We have also given instructions that the semiannual and monthly catalogues of the Department publications be sent you. In them you may find something from time to time which may be of interest.

Very truly, yours,

WILLIAM C. REDFIELD, *Secretary.*

Sr. Don JOSE DE GOROSTIZAGA,

Juan de Mena No. 23, Madrid, Spain.

The Bureau of Foreign and Domestic Commerce maintains branch offices in the cities of New York, Boston, Chicago, St. Louis, Atlanta, New Orleans, San Francisco, and Seattle. These offices are established not only for the cities in which they are located but for the districts about them, in which they serve as the stimulators and developers of foreign and domestic trade. They bring the promotive work of the service into the office and to the desk of the individual manufacturer and merchant. Their value is evidenced by the demand for their services and by the earnest and repeated requests from other important cities for an extension of the service to them, with which invitations it is impossible to comply, for lack of funds. The New York office had 1,566 visitors in the four weeks ended September 28, 1915. On one day there were 104 visitors. The Boston office had 421 visitors that month. Chicago had 530. These eight

offices distribute information collected by the Bureau from all over the world, and conduct special investigations for the Bureau. They arrange conferences between American consular officers and the special agents of our own service who have returned from abroad and the business men interested in foreign trade in the fields from which these officers come. They aid foreign purchasers in forming desirable connections with American manufacturers and exporters; they confer with commercial organizations and business men in regard to trade conditions at home and abroad. In brief, each office represents in its city and to the district surrounding it the great work which this important service is carrying on through the commercial attachés and the commercial agents and the consular service all around the globe. The commercial agents in charge of these offices notify the business men in their districts of the visits of our officers coming from abroad. They furnish suitable facilities for the display of samples, specifications, and the like. They tell of the coming of important foreign buyers and provide a place of meeting where the American seller and the foreign buyer can get together. They bring the American manufacturer and exporter into direct contact with our returning commercial agents and afford them an opportunity to ask the man who has just visited them direct and pertinent questions concerning the markets visited. The requests for work of this character are so numerous that it is impossible to meet the demand with the force and in the time available. When a foreign buyer visits a city containing a branch office, the buyer is invited to make that office his headquarters during his stay, and the commercial agent renders every assistance possible in placing the purchaser in touch with all parties who can furnish the needed goods. The following telegram addressed to the Secretary of Commerce, dated June 23, 1915, from the representative of the Society of Moscow, who made his headquarters for some time at the branch office in New York, speaks for itself:

Referring to telephone conversation with the Chief of the Bureau of Foreign and Domestic Commerce and the commercial agent in charge of the Bureau's New York office, we respectfully announce the closing of a three to five year contract for the annual movement of American merchandise to Russia up to \$2,000,000, made possible by the assistance of the Bureau of Foreign and Domestic Commerce. We express our sincere appreciation. •

A representative of a foreign iron and steel concern visited the United States to make purchases. He was primarily inter-

ested in the products of certain firms in Pennsylvania and Ohio. The commercial agent in charge at Chicago, being an expert in those lines, was instructed to accompany this purchaser and render any assistance in his power. As a result of this visit thus conducted large orders were placed by the buyer, and a letter to the Bureau attested his appreciation of the services rendered by the commercial agent.

The routine work of the New York office for a single recent month also included the receipt of 6,000 letters and the mailing of 5,000 "Foreign trade opportunities." In this single office during the fiscal year five times as many callers were received as during the preceding fiscal year, and three times the volume of correspondence went on.

The service is being extended to what we may call "cooperating branches." When a local commercial organization puts in charge of its export department at least one full-time employee with satisfactory qualifications, the Bureau of Foreign and Domestic Commerce undertakes to supply that organization with all the information furnished its own branch offices. Frequent reports are required in such cases, and to insure uniformity in methods and satisfactory service to the local community each cooperating branch is placed under the general supervision of the manager of the appropriate branch office of the Bureau. The commercial organizations cooperating in this manner with the Bureau of Foreign and Domestic Commerce are the Cleveland Chamber of Commerce, the Cincinnati Chamber of Commerce, the Los Angeles Chamber of Commerce, and the Detroit Board of Commerce. The Philadelphia Chamber of Commerce has been added since the year closed.

Reorganization of Statistical Service.

During the last fiscal year a comprehensive study of the statistical methods affecting the returns of exports and imports was made by Mr. Frank R. Rutter, an Assistant Chief of the Bureau of Foreign and Domestic Commerce, in cooperation with statistical committees appointed by this Department and by the Treasury Department. Perhaps the most striking result has been the installation of tabulating machines at the New York Customhouse, where the statistics of exports and imports for the whole country have been tabulated since July 1, 1915. Returns are made out by statistical clerks at the various ports on special forms which are transmitted daily to New York. There the data are trans-

ferred to punched cards, which are then assorted and tabulated mechanically, and the results are automatically listed. The sheets so printed are then transmitted monthly to the Bureau in two series, the first being confined to the data required for publication in the Monthly Summary of Foreign Commerce and the second, transmitted later, showing full details required for the publication of the annual report.

The advantages of the new system are the prompter returns received from the customhouses, the facilities afforded for showing greater details in the classification, and the elimination of much purely clerical labor, which will permit a more careful scrutiny of the returns and thus insure a higher degree of accuracy. It is not expected that the new system will result in a saving in total outlay. It will, however, it is believed, bring about, without an increase in cost, a larger output of statistical work, and will result in gains both in respect to timeliness and accuracy.

Much greater gain in accuracy can, however, be anticipated from certain changes that are being introduced in customs procedure. In order to make statistics of imports correct from the start, so far as this ideal can be realized, it is proposed to introduce a statistical as well as a fiscal examination of the returns before the entry is accepted from the importer or customs broker.

On the export side much inaccuracy has existed up to the present time. No method has been employed to insure statistical returns in the case of every shipment that leaves the country, and it is therefore impossible to estimate the degree of incompleteness of our published exports. It is known, however, that the total value of our exports has been understated. An agreement has been reached between the two Departments to modify the present practice in respect to export declarations; this change will undoubtedly go a long way, just as far as it is possible to go under existing legislation, to obtain complete returns. After January 1, 1916, no vessel will be allowed to clear until all shippers' declarations have been filed at the customhouse, or, in lieu thereof, a bond has been given to produce the missing declarations within a period of 15 days. A new form of declaration has been provided that will keep strictly confidential the information in respect to value contained on the export declaration, and will enable the original shipper, instead of his agent at the port, to make out the document. This last is important. We need, and should have, a first-hand statement from the man who knows the facts, and the cooperation of the business public to this end is urged.

Heretofore the manifest required from the carrier, whether railroad or steamboat, has been in the vast majority of cases merely a transcript from the export declarations of the shippers, and for this reason has constituted no real check on the accuracy of the latter. After January 1, 1916, these manifests are to be made up from the records of the carriers themselves, in the case of railroads duplicate copies of the way bills being accepted and in the case of steamships a compilation from the dock sheets. Clerical labor on the part of the carrier will be thus materially lessened and an independent record obtained to serve as a means of verifying the shippers' declarations.

There is an imperative need of a modification of the statistical classification now in use so as to correspond more closely with commercial usage, and to show the details needed by our exporters. The extent to which the classification can be enlarged will depend upon the capacity of the new tabulating machines. The whole subject will be carefully examined by the Bureau during the present fiscal year, and commercial organizations and business men are invited to present their needs to the Bureau for consideration.

In accord with the desire to make the statistical service of greater practical assistance to exporters, it is proposed to change the annual returns from the fiscal year to the calendar year. This change will require new legislation, but it will result in greater comparability with commercial statistics of other countries, with our own census returns, and with the usual book-keeping year of business houses. It is intended to simplify the returns by eliminating some distinctions deemed meaningless or even confusing to the public.

"Commerce Reports."

Through the cooperation of the State Department and the Government Printing Office, it was possible at the beginning of January, 1915, to expedite the issue of the daily publication of the Bureau of Foreign and Domestic Commerce so that a dispatch or cablegram from a consul or a field agent of this Department is printed and mailed to subscribers within twelve hours after the report is received at Washington. Within this period the dispatch, if received from a consul, is examined at the State Department, edited in the Bureau of Foreign and Domestic Commerce, printed, and put in the mail. To emphasize this change, and to identify our daily publication more completely

with the whole work of the Department, the title was changed from "Daily Consular and Trade Reports" to "Commerce Reports." The business public has shown its appreciation of the increased value of the publication by a greatly increased number of subscriptions, with the result that the total amount of subscriptions paid exceeds the amount for any other publication of this Government.

Cost of Production.

The first full investigation conducted under the "cost of production" appropriation—that on the pottery industry—was completed and published during the last fiscal year. The report contained a careful analysis of all aspects of the industry in the United States, with a comparison of conditions in England, Germany, and Austria.

Similar studies were undertaken dealing with the general subject of clothing. Three of these reports—on women's muslin underwear, on hosiery, and on knit goods—were well advanced by the end of the fiscal year, and have since been completed. The field work was finished on the investigations of the cost of production of men's shirts and collars, and men's clothing, and reports on these subjects are now in course of preparation. Unfortunately the outbreak of the war prevented the extension of these investigations to European countries, so that a comparison of conditions here and abroad has been impracticable.

It is unfortunate that the wording of the appropriation confines this line of work to the cost of production. This is but one factor in determining our competitive ability as compared with foreign countries. The question of prices, proximity to the market and capacity of the market, the technical equipment of factories, and the cost of distributing the product when completed are all questions that merit careful investigation. Moreover, the term "cost of production" has come to have in the popular mind a political significance, since it has been used by a political party as a measure for tariff rates. These investigations should be divorced from any partisan bias and they should cover every important phase of industrial activity. To this end I recommend that the language of the appropriation act be broadened so as to permit a study of all phases of the industries under investigation. This valuable work calls for extensions both in the amount of the appropriation and in the lines of study authorized.

Cost of Distribution.

We give much attention to railway freight rates, but we neglect a matter of far greater importance. The expense imposed upon consumers by the single item of cartage in distributing goods is certainly many times larger than the total cost of railway freights, possibly 10 times as great. We know little about it, but the facts we do know are sufficient to show that we might well divert our thought from things deemed important which are relatively trifles, and look carefully into this serious matter. We know that the item of retail delivery costs more than all the transportation processes preceding it. We know that in phases of food distribution the necessary cost is multiplied eightfold or more by wasteful methods. It is certain that the cartage cost in half a dozen of our great cities runs up into hundreds of millions per annum, but few seem to think it worth while to study the matter. Inquiry into this subject might have far-reaching effects upon the cost of living, about which we talk so much while ignoring this very large element in it.

Appointments by Examination.

To make our field work as effective as possible, it is essential to select for each task the man best qualified to perform it. The selection of men is extremely difficult, since the salaries we can pay are modest, the term of employment in many cases is short, and our requirements extremely exacting. In the case of commercial agents and special agents, the man must be a specialist in the line on which he is to report, he must speak the language of the countries to which he is to be sent, and he must be a keen observer, able to report clearly the lessons that he learns.

Prior to last January selection was made in accordance with the statements of experience submitted by various candidates. The success of the examination system in the selection of commercial attachés made it seem desirable to use the same method in making appointments for other field service. After a voluminous correspondence, especially with commercial bodies concerned with the subject about to be investigated, a list of candidates is made up who are given a stringent written examination designed to test their qualifications. Those who pass most successfully the written examination administered by the Civil Service Commission are then invited to appear for oral examination before a committee of the officers of the Bureau and a representative of the Civil Service Commission. The results of the examination already held have been eminently satisfactory.

A large increase in the appropriation for this service is essential if the present standard of work is to be kept up, much more if its scope is to be extended to meet the demands of the business community. The work done speaks for itself. It returns manifold its cost to our commerce and industries. It is distinctly and directly productive. It is not an expense, but a profitable investment. Our country turns to the foreign field in commerce as never before in its history. Our finance, our industry, our agriculture, our merchandising, all are reaching out into lands abroad for the greater business they must have if American factories are to run full time with full product and if we are to maintain and extend the position which within the last year we have attained. There is a new spirit in American business—a spirit of outreach, a spirit of confidence in its own power, a desire for touch with the great markets of the world. The tide of our foreign trade runs strongly at its full and the wealth of the nations flows into our coffers. It is not long since we were a debtor nation. We have become a creditor. We confidently depend upon the wisdom of Congress, which has already supported this work, for the force and the funds with which to extend it.

For the administrative work at Washington a large increase is imperative. For years the field services of the Bureau have been extended and the demands of the American public for information have increased, with a decrease rather than an increase in the number of employees and the amount provided for statutory salaries. The field services to be effective must be carefully directed, and to this end it is imperative that considerable provision be made for the establishment of divisions under qualified chiefs to direct the activities of the commercial attachés, of the field agents abroad, and of the branch offices in this country.

The success of the commercial attachés during their first year demonstrates the need of increasing their number so as to cover many new centers of commercial importance. Even with the existing corps of attachés the appropriation is inadequate to permit the proper amount of travel and the Bureau has been compelled to limit the use of the cable to cases of extreme importance.

Larger sums are needed for field investigations both in Latin America and in other parts of the world. Much of the appropriation for promoting commerce has been needed for the establishment of branch offices. These must be strengthened to meet the increasing demands upon them as business houses come to appreciate more and more the valuable services that they furnish.

With the return of peace we must not lose what we have gained in Latin America and elsewhere, but must be ready to meet the competition of European sellers.

Heretofore we have studied almost exclusively foreign trade; it is time we turned our attention once more to domestic commerce. Some years ago statistics of internal commerce were collected in a fragmentary way, but with the lapse of the appropriation for this purpose the service had to be discontinued. It needs to be reestablished, not on the former scale, when only fragmentary information could be gathered, but on a scale commensurate with the importance of the subject and adequate to furnish the information needed. We are ignorant of many of the great movements of our own internal commerce, and because of that ignorance must leave undone much that would be helpful to it. We are proceeding concerning the great movements of our domestic trade by "rule of thumb," in the dark, and without knowing the precise facts. We do not know the relative importance of things which are but vaguely known to be important. It is an ignorance of which we should be ashamed and to which an end should be put.

Yet

The opening of the Panama Canal and the new inter-oceanic waterway along the Atlantic coast make it imperative that we should know what we are about as regards our overseas commerce. It is a surprising thing that we should require so little careful knowledge concerning our export trade and allow our domestic commerce to go on without any of the knowledge concerning it. This is caring for the cents and neglecting the dollars. It is looking after the little and neglecting the large. Congress will be asked for an appropriation sufficient to permit the beginning of an effort to throw the Government out of such vast importance but of which we know so little.

The extraordinary economic conditions resulting from the European war have opened wide the door of opportunity for foreign trade to American manufacturers. Many of the latter have for the first time realized the importance of this trade and have become interested and have begun to develop new export business who up to the time of the outbreak of the war had no thought or interest in foreign markets. This widening of the door has greatly added to the work of the Bureau of Foreign and Domestic Commerce. Its office staff, already overworked, has been obliged to be put in a steadily increasing amount of overtime to keep the current work up. It has, therefore, found it necessary for expansion or for development of new promotional agencies. It is especially important that at this time with the new opportunities in foreign trade now open to our country, the Bureau of Foreign and Domestic Commerce be provided with an adequate clerical staff, so as to cope with the equally increasing volume of work. The American manufacturer and merchant needs for his command service in promoting trade at home and abroad and our European competitors.

The time of opportunity is now and the door is wide open. Entrance into it is more free than it has ever been before. The Bureau has accomplished large practical results in the past. American producers to get business and to get more of it. This has reacted in the employment of more people in the work. It is a profitable work. It means more work for the American employer and the American worker. It means much more to-morrow if the representatives of the Government, of the workmen and of the people whom the Government has facilities and funds equal to the opportunity to do so.

For the details of the work of the Bureau, the Secretary is asked to the annual report of the Chief of the Bureau.

a clear and interesting picture. It remains to renew my expression of appreciation of the invaluable assistance of the Consular Service in the work of our Department. The spirit of good will and of assistance which that service shows is wholly admirable. I desire to place on record my thanks to the Secretary of State and his associates in charge of the consular work. If there are any who may have thought that the work of the commercial attaché would in any degree conflict with that of our consular officers, they may put their fears at rest. Where services are animated by the spirit of mutual helpfulness, where each is glad for all the other can do of a common good and is more than willing to help in the common work, there is no room for small jealousies. We gladly acknowledge the debt of the American business world to the efficient and improving Consular Service and we are glad to have the privilege of cooperating with that service in bringing before the business world the results of their effective activities.

Commercial Attachés.

The work of the commercial attaché has so fully justified itself that there is urgent demand for its considerable extension. If there ever is a time at which that extension is urgently necessary, that time is to-day. A large portion of our possible foreign markets are entirely untouched by the commercial attaché service and other important markets are so combined as to receive inadequate service. There are no commercial attachés in Central America, India, the Near East, South Africa, or Canada. These are among the best possible markets for the goods of the United States. Spain, Portugal, and Italy receive but partial care through the commercial attaché stationed in Paris. Spain and Italy should each have a commercial attaché. The Spanish Government has been especially cordial to our commercial attaché to France when visiting Spain. The American Chamber of Commerce in Milan asked on May 18, 1915, that our Government appoint a commercial attaché for Italy, as will be seen from the following letter:

AMERICAN CHAMBER OF COMMERCE IN MILAN,
Milan, May 18, 1915.

SECRETARY OF COMMERCE,
Department of Commerce and Labor,
Washington, D. C.

DEAR SIR: At a regular meeting of the board of directors of the American Chamber of Commerce in Milan held on Monday the 17th instant it was decided to urge on the Government of Washington to appoint a commercial attaché for Italy.

He will find here a splendid field, as there was never a better opportunity than the present for America to get and hold its share of the business in Italy.

Italy's sources of supply for much that she has used in the past have been closed, owing to the present political conditions, and her outlet for production of all kinds has also been closed in those countries, viz, Russia, Austria, Germany, and England.

The exports from the United States could be multiplied many times as could also the imports into United States from Italy if American business men could wake up to the fact that Italy is a great and growing country and by having a commercial representative attached to the embassy at Rome who could visit the different parts of Italy and study the needs as well as what these different parts of Italy can supply to America; he could with the cooperation of the American Chamber of Commerce give aid and advice which would have so much greater value because of his official position, and would thus greatly help the overwork of consular officials who have neither the time nor the training to obtain the information that this specialist will get.

Thanking you in advance for the interest which we are sure you will take in our request, we remain

Faithfully yours,

AMERICAN CHAMBER OF COMMERCE IN MILAN,
CHARLES F. HAUSS, *President*.

One should be appointed to the Scandinavian countries, another to Japan. Holland and through her the immensely important Dutch colonial empire in the Far East should also receive one. There should be a commercial attaché in India, in South Africa, in the Near East (which includes Egypt, Persia, Asia Minor, Greece, Roumania, and other Balkan States), in Central America, and in Venezuela and Colombia. It is therefore earnestly urged that Congress grant the request which will be made to establish the above ten additional commercial attachés.

It must be emphasized that the force of commercial attachés is a trained and picked force of men, selected for their peculiar qualifications for the work. They speak the language of the country to which they are assigned or a language current in commercial circles therein. They understand the principles and practice of export trade. They must meet on equal terms the best commercial minds of the countries to which they are assigned, representing therein the best and brightest in American commercial life. The post, therefore, of commercial attaché calls for exceptionally good men of special training.

Commercial Agents.

A number of investigations into special subjects have been conducted by the twelve commercial agents of the Bureau of Foreign and Domestic Commerce during the last fiscal year. Hardware received the attention which, in view of the magnitude of the industry and the opportunity for increasing our sales to foreign countries, it has long deserved. Mr. S. S. Brill traveled extensively in South America studying the special needs of the market, and collected samples of the kinds most in demand with full details of their cost, the character of competition to be met,

and other information required by prospective exporters. From other countries similar detailed reports were asked from the commercial attachés, who were instructed to contract with hardware experts in each of the countries to which they were accredited to collect the information and the samples needed to open the way for the sale of American goods. The reports so obtained and the samples of these articles purchased by the attachés are fully expected to make one of the most complete studies of a foreign market for American goods ever undertaken by the Bureau. It is also intended to use the samples collected as a nucleus of a sample room to be established at the New York branch office of the Bureau.

The investigations of Mr. Ralph M. Odell into the markets for cotton goods were continued. Mr. Odell spent most of the last fiscal year in China, and, as a result of his study, has submitted a very full report on the market for cotton goods in that country. His work during the present year will be conducted chiefly in India. The investigation of the foreign market for lumber and lumber products was continued, Mr. Franklin H. Smith visiting for this purpose Hawaii, the Philippines, China, Siam, the Straits Settlements, and Australia, and Mr. R. E. Simmons covering the east coast of South America and Chile. Mr. Benjamin Joachim investigated the market for wearing apparel in Central America, and Mr. Garrard Harris studied general trade conditions there. Other investigations by special agents of the Bureau were confined to South America; Mr. L. L. Bucklew reporting on furniture, Mr. J. A. Massel on machines and machine tools, Mr. W. H. Lough on finances and credits, Mr. H. N. Douthitt on electrical appliances in Brazil, and Mr. E. H. Gueydan on transportation in Colombia and Venezuela.

In addition to the reports from our own officers a number of special investigations have been made by consuls at the request of the Bureau of Foreign and Domestic Commerce. Such special investigations are now carefully planned from the beginning and a schedule of the topics to be covered is included in the instruction sheet. The reports made by the consuls are consequently much more uniform and thorough than was formerly the case, and this result has been obtained without increased labor on the part of the consuls, since their attention is directed to those points on which American manufacturers need enlightenment. During the last fiscal year a comprehensive report was published on the paper and stationery trade of the world. Shorter reports treated of the

markets for soap and cooking fats in South America, the iron and steel industry in Europe, tobacco trade of the world, foreign markets for coal, and the South American market for jewelry and silverware. An exhaustive handbook on India was compiled in the Bureau from various consular reports supplemented by much information collected from all available sources.

In the past, investigations by commercial agents were confined chiefly to foreign countries. Last year it was determined to broaden the scope of this work by authorizing similar investigations in the United States. A comprehensive study has been made of the water terminals and facilities at the various ports, chiefly by Mr. Grosvenor M. Jones. An investigation which has aroused wide popular interest is that of the dyestuff situation in the United States, conducted by Dr. Thomas H. Norton. One of the first serious effects of the war was the cutting off of our supply of artificial colors previously imported from Germany, on which our textile industry and other industries were vitally dependent. By direction of Senate resolution of January 26, 1915, the situation was thoroughly investigated and made clear to the public. A number of manufacturers have entered the field and the Bureau has done much to guide lines of manufacturing so as to answer the most pressing needs of the consumer. Aside from its published reports, it has conducted a large correspondence giving advice both to prospective manufacturers and to users of dyestuffs. It is not too much to say that the work of this service has been at the very center of the growing movement toward the creation of an American dyestuff industry. In this connection signs are not lacking that the growth of our native industry is hardly welcome to those who have heretofore had a substantial monopoly in supplying our markets from abroad. Our consumers, however, have had a bitter taste of what it means to depend upon a single source of supply, and that source one which has interests of its own of so much greater importance to it that the care for them necessarily cuts off the supply of the material we need. We are the greatest producers of the raw material for the manufacture of dyestuffs. We are, if not the greatest, at least one of the greatest, consumers of the finished product. It is intolerable that we should longer depend upon any one foreign source for these necessities of industry and it is equally intolerable that we should permit any possible unfair foreign competition to destroy a growing industry upon which so much depends by methods that would not be permitted by our law if used by our own citizens.

BUREAU OF CORPORATIONS.

By operation of law the Bureau of Corporations was merged into the Federal Trade Commission upon the organization of the latter on the 16th day of March, 1915.

In the last annual report of this Department the impending separation of the Bureau of Corporations was referred to, and, in addition to describing the work done during the fiscal year reported on, a statement was made regarding the progress of work subsequent thereto down to the date of the report, November 10, 1914. The connection of the Bureau with this Department continued, however, for about four months thereafter, and in order to formally complete the record with respect to the activities of the Bureau of Corporations it will be sufficient in the present report to refer very briefly to the general activities of the Bureau of Corporations during the fiscal year 1915 and to the reports issued by it during that year.

The fact that the Bureau of Corporations was merged into the Federal Trade Commission necessarily affected the character of the work done by the Bureau during the fiscal year 1915. In addition to the regular work which was pending, much additional work was done in the gathering of information which would be valuable and immediately useful for the Federal Trade Commission upon its organization. Along this line were extensive investigations into the laws of "unfair competition" in foreign countries; the preparation of a card index of directors of the principal industrial and banking corporations of the nation; and the assembling of a large number of corporation reports obtained from the large corporations engaged in interstate commerce. During the fiscal year 1915, up to the 16th of March of that year, the following reports were issued by the Commissioner of Corporations:

Lumber Industry, Part II—Concentration of Timber Ownership in Important Selected Regions; dated July 13, 1914.

Lumber Industry, Part III—Land Holdings of Large Timber Owners; dated July 13, 1914.

Taxation of Corporations, Part V—Mountain and Pacific States; dated September 8, 1914.

Annual Report for the Fiscal Year 1914; dated October 8, 1914.

Conditions in the Healdton Oil Field; dated March 15, 1915.

Tobacco Industry, Part III—Prices, Costs, and Profits; dated March 15, 1915.

Farm Machinery Trade Associations; dated March 15, 1915.

State Laws Concerning Foreign Corporations; dated March 15, 1915.

Trust Laws and Unfair Competition; dated March 15, 1915.

The Bureau of Corporations, which had been an important agency of the Department of Commerce from its first establishment, in 1903, was thus severed from it after 12 years of conspicuous activity. During this period of its connection with the Department of Commerce under the direction of James R. Garfield, Herbert Knox Smith, Luther Conant, jr., and Joseph E. Davies, the several Commissioners of Corporations, it achieved marked success in the performance of the duties imposed upon it by law, namely, the impartial and thorough investigation of facts regarding certain business organizations and methods of competition. Extensive investigations and careful reports were prepared upon many matters, and among them the following: Beef Industry; Transportation of Petroleum; Report on the Petroleum Industry (in two parts); Report on Cotton Exchanges (in five parts); Report on Tobacco Industry (in three parts); Report on the Taxation of Corporations (in six parts); Report on Transportation by Water in the United States (in four parts); Report on the Steel Industry (in three parts); Report on the Lumber Industry (in four parts); Special Report on Present and Past Conditions in the Lumber and Shingle Industry in the State of Washington; Report on Cotton Tare; Report on Water-Power Development in the United States (in three parts); Report on the International Harvester Co.; Report on Conditions in the Healdton Oil Field; Report on Farm Machinery Trade Associations; Report on State Laws Concerning Foreign Corporations; Report on Trust Laws and Unfair Competition.

Extraordinary powers of investigation were conferred upon the Secretary of Commerce and the Commissioner of Corporations in connection with this work, and the exercise of these powers demanded tact and discretion.

Reports of this Bureau have enjoyed high reputation among scholars and experts, and undoubtedly had important influence in the development of governmental policy toward business and in the development of Federal legislation pertaining thereto.

The work of the Bureau of Corporations was antecedent and preliminary to the work now intrusted to the Federal Trade Commission, and the powers of the latter are the logical development of the functions of the Bureau of Corporations, which is now absorbed in its activities.

BUREAU OF STANDARDS.

The Bureau of Standards serves as a testing bureau for the Government, but it is a great deal more than that. It is a national physical laboratory, including such branches of chemistry and engineering as are necessary to accomplish standardization in the broad modern sense. This means that it is not only engaged both in testing and research for all the departments of the Government, but that its work is of vital interest to our industries, our commerce, and the entire field of development of scientific investigation.

Standardization not only enters into the familiar fields of commerce and trade, but it directly affects industrial processes, engineering practice, and many forms of legislation. The Bureau of Standards does the scientific and technical work requisite to develop and make useful to everyone standards of measurement, standard values of physical and technical constants, standards of quality, and standards of mechanical performance. To these are now added certain standards of practice where uniformity is needed in scientific and technical matters involved in the enactment of laws, regulations, technical codes, and the like.

The Bureau works in close harmony with the great technical and engineering societies of the country and with the practical engineers who in many lines of applied science are doing the work of the world. It is an intensely practical service, bearing directly and daily upon the life of our people. At one end of its work is research into things as yet unknown. At the other end is the putting of things discovered and determined at the service of our people. It studies in cooperation with the technical staff of our great railways the problems that underlie our transportation systems. In cooperation with the staffs of the Army and Navy it studies the problems of the wireless telegraph. It deals with the principles involved in aviation, with the character and behavior of structural materials and their resistance to fire, weather, and wear, with the accurate testing of instruments and the development of new ones for improved methods of testing and research. It reaches into the home by publications showing how accurate knowledge is helpful in domestic life. It

studies the problems of chemistry and electricity, and operates a varied mechanical plant, working out the problems that vex the industrial manager.

It investigates the scientific principles beneath public-utility services and places at the disposal of the public and their official representatives that same accurate knowledge of public utilities which is furnished to the operating companies by their own technical staff. It works out the principles and practice of refrigeration, and operates testing cars that run about the land saying whether track scales tell the truth. It tests textiles and rubber and paper and numerous other materials. It studies how columns of different kinds behave under stress, and gives close care to the accurate timing of watches. It deals with bridge construction and with the members of wireless towers. It investigates standards of color, and tests photographic lenses. It studies illumination, and determines the accuracy of weights and measures. It does much more of the same general character.

It covers a site of 16 acres and occupies four laboratories 200 feet in length by 55 to 60 feet in width, four stories high. A fifth laboratory (the chemical laboratory) has been authorized, and on September 13, 1915, a contract was entered into for its construction at a cost of \$188,556. Future plans include two more large laboratories. Four smaller buildings for special work have been constructed, and a large water-current meter testing tank is just about completed.

The Bureau operates a mechanical plant at Pittsburgh, Pa., in temporary quarters in the old arsenal grounds, through the courtesy of the War Department. It has long conducted a cement-testing plant in the cement district at Northampton, Pa.

Standards of measurement are those which concretely define units of measure. They underlie every indication of quantity or dimension. On such standards rests the application of scientific data to industry.

Standard values of physical and technical constants are those measured data determined with accuracy which control industrial processes. Every engineer has handbooks giving him data which he uses in his daily work, whatever it may be. The effectiveness of that work, and therefore of his service, is often in direct proportion to the correctness of the data he uses. The determination of such standard data is an important function of the Bureau of Standards.

Standards of quality are modern in the scientific sense. Such a standard may take the form of a sample of a material found suitable for a given purpose. It is preferably, however, a description of the properties of the required material in terms of measurable quantities which both the maker and the user can understand and apply. In the latter form they are known as technical specifications. In proportion as these are given in units of weight and measure describing the properties which insure the desired quality the specification becomes a standard of quality. To determine such standards demands the widest range of experience in testing and using materials and the most careful experimental study of the underlying scientific principles. This important function of the Bureau of Standards is rapidly gaining public appreciation.

Standards of mechanical performance are specifications, in measurable terms, as to the performance of a device or machine. These standards are perhaps the most complicated of all, since they involve standards of measurement, standard values of constants, and standards of quality. In this field of standardizing mechanical performance the Bureau's work has been confined largely to assistance given Government services in the design and specification of equipment, but the necessity for this work in connection with the Government alone has far outgrown the Bureau's facilities.

Standards of practice are involved when enacting laws in which technical and scientific matters are concerned, in ordinances regulating public utilities, and in establishing building and safety codes. Like standards of performance, they are dependent also upon both standards of measurement and standards of quality, and bear directly on the welfare and safety of the public. The citizen depends upon these standards, though he may not know it, when he rides in a trolley car, lights the gas or electricity in his house, or uses a gas range in his kitchen.

It may be truly said of the Bureau of Standards that its field is the scientific world, and this can be interpreted as widely as the needs of man. In this broad field the Bureau can of course touch only upon the more important aspects of the work where an authoritative value or national uniformity is required. It does not enter fields which can be covered effectively by private laboratories. It cooperates with such. It does not seek either to replace or to compete with them.

Weights and Measures.

The Bureau of Standards has continued the work of stimulating a nation-wide interest in the weights and measures of daily trade. Without a systematic inspection service through the country for trade measures, the honest dealer is at a disadvantage and the consumer helpless, since the standards involved are in the custody of the Government. The Bureau accomplishes this purpose largely through State and local inspectors, by comparing their standards with those of the Government, by instructing them as to apparatus, methods of inspection, and tolerances, and by aiding in the preparation of laws and ordinances. It also aids manufacturers of weighing and measuring devices by comparing their standards with those of the Government and by furnishing them with the essential principles involved in the construction of such apparatus. In many cases the public standards are compared directly with those of the Bureau; as, for example, the standards used by the industries in the regulation of their weighing and measuring devices. This service to the public is not limited to assuring the length of the yard, the weight of the pound, or the capacity of the gallon. It includes all factors affecting the correctness of measurements. The Bureau makes a theoretical study of the sources of error in measuring devices, suggests methods of measurement, methods of testing instruments, tolerances, standard containers, and other matters entering into an efficient weights and measures inspection service.

The Tenth Annual Conference on Weights and Measures was held on May 25-28, 1915. There were present 28 delegates representing 18 States, the District of Columbia, and the Philippine Islands, and 69 city and county weights and measures officials; also 80 visitors representing railroads, manufacturers of weighing and measuring apparatus, trade bodies, etc.

The Bureau exerts a far-reaching effect on the standards of fair dealing in trade. It is the recognized center of such matters, where one interested in weights and measures may come for assistance, and where all are assured of a fair hearing in case of disagreement. Manufacturers of measuring instruments come for suggestions as to improving their products and State and city officials visit the Bureau to examine its equipment and methods. State legislators and officials request the Bureau's judgment in technical details of inspection service, and the Bureau's opinion is sought by Congress upon matters pertaining to weights and measures legislation.

The Bureau cooperates with the Treasury and Agricultural Departments in the enforcement of the law requiring the quantity contained to be marked on package goods. The enactment of this law was the result of the movement toward correct weights and measures which has been going on throughout the country since the establishment of the Bureau. This law gives the consumer a direct knowledge of the net quantity of the product in most of the packages he buys. The Bureau's experts assist the board designated by law in the technical details of specification and measurement of quantity.

The large number of tests made for State governments and the requests for information from them indicate the growing interest in weights and measures inspection. The purchase by several States of additional standards also shows the expansion of State work.

During the past year there has been a very decided movement on the part of the Government bureaus toward the inspection and regulation of weighing and measuring devices used in purchasing supplies. This has included the specification and testing by the Bureau of the scales used in the Postal Service, customhouses, navy yards, Government institutions, and reservations. The importance of this work can only be realized by one familiar with the enormous amount of supplies purchased by the Government and the wide variation in the quality of all measuring devices. At no time in the Bureau's history has it rendered this service to such an extent as during the past year.

The testing car equipped for testing railroad track scales, which was purchased in 1913, has been in continuous service throughout the fiscal year except for one month while under repair. Through it the master scale of the State of Minnesota was standardized in July, 1914. Since then there have been tested 338 railroad track scales in the States of Minnesota, Wisconsin, Indiana, Iowa, Missouri, West Virginia, Virginia, North Carolina, South Carolina, Georgia, Florida, and Alabama, and in the District of Columbia. Seventy-eight other scales were tested in the navy yards at Norfolk, Va., Charleston, S. C., Key West, Fla., and Pensacola, Fla. Large scales were tested in 86 different cities and towns. Railroads owned 241 of the scales tested, manufacturing concerns owned 89, and the Federal Government owned 8. Two-thirds of the track scales failed to pass the tolerance (200 pounds in 100,000) adopted by the Bureau. The possible error in weighing

a 100,000-pound car was found to vary from 30 pounds to 21,600 pounds.

Reports on the condition of these scales were rendered to the organized departments of weights and measures of the respective States and to the owners of the scales. Advice relative to the proper maintenance and repair of the scales was a part of the report. Appreciative replies to these reports have been received, and usually repairs or new installations have followed.

Improved methods are being devised for testing, adjusting, and determining the capacity of track scales, and the Bureau is preparing standard specifications for railroad track scales which will be valuable to all concerned.

In the above work 21 States have been visited since October, 1913. A second track-scale testing car has been put in operation for the further development of this important service and this is now at work in New England.

Precision Standards of Measurement.

The necessity for precision standards of measurement of length, mass, capacity, heat, light, electricity, and magnetism, in connection with scientific work, is generally appreciated. The problem of preparing and maintaining the precision standards needed by the Bureau in its own work is one which requires the most difficult researches in the field of physics and chemistry. In many cases cooperation with the national laboratories of other nations is necessary in order to secure international agreement in these fundamental standards of measurement. In all cases the Bureau aims to steadily improve the precision standards and the methods of maintaining or using them. It is not true, as is commonly supposed, that the need for precision standards of measurement arises only in connection with accurate scientific work. The requirements of the industries in this respect are often quite as exacting, sometimes more so. The Bureau assists the industrial development of the country by aiding the introduction of exact scientific methods of measurement to an extent which is appreciated by few others than those directly concerned.

Relation of Bureau's Work to Manufacturing.

In addition to the ordinary units of measurement, almost every industry has special units and methods of measurement, together with a variety of measuring instruments. The Bureau studies these with a view to their improvement. It certifies the stand-

ards by which such instruments are constructed and compared. It is frequently necessary to examine the conditions under which measuring instruments are used, to aid the manufacturer to secure accurate measuring instruments, and to apply precise methods of measurement. The Bureau is aiding the industries in this and other ways of basic importance. Modern industrial processes are often efficient in direct proportion to the precision of the methods of measurement used.

The relation of all forms of the Bureau's work to our industries has greatly increased in importance during the year. Manufacturers are coming to understand the value of applied science to them. The day of rule of thumb is passing away and accurate knowledge—that is to say, applied science—is taking its place. There are some still so ignorant as to talk about what they call "practical methods" as compared with scientific ones; but this is after all often another way of saying that they prefer not to know what they are about. A method is not less practical because it is scientific. If it is not scientific—that is, if it is done without knowledge of why it is done—it is very likely not to be practical. One of the great services the Bureau of Standards daily renders to the country is that of helping our industries to be more scientific; that is to say, to know their business better. Other countries have understood this better than we and have built up whole industries, which we have lacked, because they applied science to their processes. Unless we do this ourselves, we shall not hold a high place in the industrial race.

During the last year manufacturers have been compelled to introduce new methods, to use new materials, to develop new processes for making products formerly imported. The Bureau has striven to be of every possible use to manufacturers in this difficult period of transition, and many have taken advantage of its services.

The engineering professions have appealed to the Bureau more than ever before for facts concerning the properties of materials and for fundamental scientific data. The representatives of the organized scientific societies and technical associations of manufacturers render the Bureau valuable assistance by contributing information gained in practice and by pointing out the data which they most need. As examples, may be cited the series of commercial steel columns which have long been under test in our large Emery testing machine to develop the fundamental laws of such columns. In this work the American Society of Civil Engineers

and the American Railway Engineering Association cooperate. Both have given the Bureau valuable advice.

The determination of the fundamental constants needed by refrigerating engineers is nearing completion and constitutes one of the most difficult pieces of work undertaken by a physical laboratory. Many other illustrations of this sort can be given.

Manufacturers are intensely interested in the Bureau's work in the investigation of structural materials. It was first undertaken for the Government to secure information needed in its own structural work. This information is, however, precisely what the manufacturer of such materials needs to know, and its value to the public in this way is far greater than that through the Government service.

Manufacturers and the public likewise are interested in the Bureau's study of the fire-resisting properties of materials. Too little is known of materials of construction in this respect. The public anxiously awaits data upon which may be based reasonable codes and regulations looking toward the prevention of the enormous annual losses due to fire.

The Bureau has in progress several important investigations for the cement industry to determine the properties upon which the value of this important material depends.

Manufacturers of clay products increasingly demand information about the properties of the materials they use. They seek such knowledge also of their manufactured product, whether it be pottery, terra cotta, building brick, tile, fire brick, fire-clay crucibles and retorts, or enameled iron ware. In few industries is there greater opportunity for improvement by the application of precise methods of measurement and of scientific knowledge. These industries are making rapid strides in the applications of science, and have been compelled to meet many new conditions during the past year. An item has again been included in the annual estimates providing for the continued study of this important line of industry.

During the year the production of chemical porcelain on a commercial basis has begun in this country. The clay products division of the Bureau of Standards, located at Pittsburgh, Pa., having worked the subject out fully, presented the results of their labors to manufacturers, and two concerns are now producing chemical porcelain ware of satisfactory quality. The same division of the service is working with success on the problem of producing optical glass of the best quality. Neither

chemical porcelain nor optical glass of the best grade has heretofore been made in this country.

These are but examples of the intimate contact of the Bureau's work with industry. They show in part how its work is vital to industrial development. Similar examples from almost every industry could be given.

Another important service of the Bureau is the stimulus which it continually gives to the establishment of industrial research laboratories. Since the establishment of the Bureau this has become a distinct industrial movement in the country. Many large manufacturing plants now have well-equipped laboratories for scientific research. These utilize the work of the Bureau and are enabled to carry on investigations which would otherwise be impossible. These laboratories are notably increasing the applications of science to industry. The Bureau has shown the need for technical research by calling attention to unsettled problems, and in pointing out the values of specific researches by actual instances of service rendered.

Educational Institutions and the Bureau of Standards.

The scientific laboratories of the higher institutions of learning are engaged in investigational work in every branch of science. In all of these researches, especially in physics and chemistry, precision standards are needed. Before the establishment of the Bureau an investigator was frequently required to spend more time in the preparation of the standards of measurement used than in the main work at hand. During the year the Bureau has performed services of this character for practically every university in the country and especially for the State universities. These institutions are in constant correspondence with the Bureau in reference to the standards, methods of measurement, values of physical constants, and the properties of materials, the latter especially in connection with technical education. The Bureau publications are found in the reference libraries of the universities and technical schools; in many its publications are used in connection with the instructional work.

This service to educational institutions is highly appreciated by them. The American Physical Society, composed of instructors and investigators in physics, holds annual meetings at the Bureau that its members may become familiar with its work. Similar meetings are held by other scientific societies. It has become the custom in many technical schools for the

senior classes in science and engineering to visit manufacturing plants and other laboratories during vacation, and the Bureau of Standards is generally included in the itinerary.

The Bureau cooperates with educational institutions in planning and carrying out scientific investigations in those matters which pertain to the Bureau's various fields of activity.

The Bureau of Standards as a Government Testing Bureau.

The various branches of the Government service have availed themselves of the facilities offered by the Bureau for testing until approximately 90 per cent of the Bureau's testing is for the Government service. This large proportion is due to the fact that the commercial testing of materials to ascertain whether or not they comply with specification is done only for the Government, except in unusual cases, where the public is not provided with suitable facilities. The actual testing for the public is confined largely to standards of measurement. The Bureau has thus become a testing laboratory for the Government, performing more than a hundred thousand tests during the year for its various bureaus and independent establishments. It serves them in questions pertaining to units, standards, measuring instruments, methods of testing material, and in the planning of devices and apparatus when the Bureau is especially fitted by equipment, facilities, and personnel to render expert assistance. It tests many thousand samples of materials delivered under contracts, to ascertain whether they conform to the quality standards specified. This work is carried on in such manner that the experience gained may be utilized in drafting improved specifications—that is, in the development of standards of quality—and it has contributed largely toward placing Government purchases on a scientific and businesslike basis.

The Bureau has made many special studies of the properties of the more important structural materials, as well as paints, oils, varnishes, textiles, paper, rubber, inks, and other miscellaneous materials, with a view to securing the information needed in the improvement of Government specifications. Many of these materials are now purchased under definite specifications and the supplies delivered tested. The importance of chemical tests in this connection has increasingly engaged the attention of the Bureau. It has conducted many chemical tests in connection with the specification of purchases of Government supplies. By supplementing these chemical tests with physical tests, it is fre-

quently found possible to select material which would best meet the service conditions and specify them in terms of susceptible measurement. Both the manufacturer and Government gain by the use of a definite specification of the properties of the materials desired. This is possible to a far greater extent than is realized. The useful character of the service being rendered by the Bureau in the testing of materials used in Government construction is evident when it is remembered that by this systematic testing efficiency and safety are guaranteed as fully as the present state of the arts will allow. The many rejections of unfit material are a partial index to the defective construction that might have been accepted without such testing. Furthermore, there is a growing conviction on the part of those experienced in such testing that it should be performed by an agency which is connected with neither the buyer nor the seller. This work leads to the adoption of standard specifications for materials for all purposes, and the results which can be given to the public are perhaps of even greater value to it than to the Government service.

Publications and Information of the Bureau of Standards.

The Bureau of Standards renders an important service in publishing information on subjects within its scope. During the year thousands of letters were received requesting information of the most varied character as to standards, methods of measurement, and properties of materials. These requests came from a wide range of sources, including Government bureaus, State institutions, public-service corporations and commissions, industrial laboratories and plants, commercial houses engaged in foreign trade, consulting engineers, educational institutions, and the general public. The replies ranged from a brief answer to a carefully prepared report, depending on the importance of the question involved and the service to be rendered. In a large majority of the inquiries the replies were in the form of one of the Bureau's publications. These are issued in three series: The Scientific Papers, of which 254 have been issued, contain the results of the Bureau's scientific investigations; the papers of Technologic Series, of which 49 have appeared, contain the results of investigations pertaining to technological subjects, and a series of "Circulars," of which 55 have been issued, each of which contains the information the Bureau desires to give on a particular subject. When the Bureau receives a considerable number of inquiries regarding a subject, one of these is prepared on that sub-

ject, including the best information that can be obtained from any source. These are revised from time to time as new material is developed. They become the standard reply to many requests for information on the same subject but from widely different sources.

The Bureau can often suggest means of securing approved data for many industrial processes; in other cases it prevents costly experiments and minimizes the chance of failure, especially where standards of measurement are involved. The latest methods of measurement wherever developed are usually known or available to the Bureau, which thus serves as a clearing house for technical information as to materials, units, standards, instruments, and methods of measurement. While the Bureau is without police power to enforce its decisions, it has exerted a widespread influence by virtue of its unbiased attitude and its care to arrive at accurate results. The success with which the Bureau is making its results available to the public through correspondence, consultation, and publications is recognized by national technical societies, through which the Bureau is exerting an important influence in current technical practice.

Extravagant claims are often made by inventors and promoters leading to unwise investment on the part of those with limited means. The Bureau renders frequent service, sometimes in connection with the Postal Service, in indicating the fraudulent character of such claims. Often large amounts of money have been wasted on impossible schemes. The Bureau tries to convince such inventors or investors of the hopelessness of their attempt. In such cases the Bureau merely measures the performance claimed and exposes the facts. On the other hand, the Bureau is constantly assisting intelligent inventors where advice is sought upon matters properly within its functions.

The Bureau's Work in Connection with Public Utilities.

Another important and growing field of the Bureau's work has to do with the standards of measurement, of quality, and of practice concerned in the various public utilities, particularly electric light and power, gas, street railway, and telephone service. This work includes scientific and engineering research in connection with public-utility questions, the preparation of specifications regarding the quality of service, the methods of testing and inspection employed by municipalities and commissions, safety rules for use by the utility companies in safeguarding their em-

ployees and the public, and the collection and distribution of information regarding these subjects.

Regulations for gas service as made by city officials or State commissions include among other things requirements as to meter accuracy, the testing of meters, specifications as to the heat value or candlepower of the gas or both, the degree of chemical purity, the variations in pressure that may be allowed, and the frequency of tests necessary to determine whether the operating companies conform to their requirements. The Bureau made a thorough study of these questions relating to gas service, and prepared a circular on the subject which has reached its third edition. This publication has served a useful purpose as a basis for regulations which are fair both to the public and to the utility companies. It also contains model ordinances for the use of cities which control their own utilities, and rules suitable for adoption by State commissions which fix standards of service.

Another circular issued during the year gives a detailed technical discussion of the methods of gas testing. The Bureau has also been studying the questions pertaining to the specification of the electric light and power service, and the requirements that should be made by city or State commissions to govern such service. Model ordinances have been prepared to suit the various conditions met with in cities and communities of different size. A set of rules suitable for adoption by city commissions has been prepared and a digest of the requirements now in force by the various commissions. It must not be assumed that these model laws and ordinances cover in detail all of the facts involved. They are confined simply to the scientific and technical data involved which should be everywhere uniform and consistent with scientific principles.

Many important investigations have been carried on by the Bureau in the past and are now in progress for the purpose of securing the proper scientific data upon which to base such laws and regulations. This knowledge was not to be had until developed by the Bureau. As an illustration may be mentioned a study which has been in progress at the Bureau for some time as to the conditions which result in the destruction of underground pipes and metal work by stray electric currents. The Bureau has studied this question for five years and has done a large amount of work in connection with it. This has included laboratory investigations concerning the effect of electric currents on concrete and metal pipes, tests of pipe coverings, corrosion of metal

in the soils, methods of measuring soil conductivity, and other experimental phases. The results of this investigation are now being utilized in many cities to mitigate electrolysis.

A study of the protection of buildings against lightning has been in progress for the past year. A publication on the subject will soon be issued. This includes a discussion of methods of lightning protection, results of experience as shown in vital statistics, and records of fire insurance companies, and other useful information. The Bureau has also been engaged in a study of life hazards in electrical practice and in the preparation of a national electrical safety code, also a national gas safety code along the same general lines. In the preparation of these codes the Bureau is receiving the cordial support and cooperation of the interests involved.

The Bureau aims to serve as a clearing house for information on the scientific and technical questions arising in connection with the regulation of such utilities. In some States there are no public-service commissions to issue regulations or inspect the quality and safety of the service rendered by the various utility companies. In others these commissions have taken little or no action in such matters, although having authority to do so. In either case, cities and towns must look after their own interests and have frequently taken the matter up with enterprise and understanding, and the Bureau has been able to render them valuable assistance in the way of scientific and technical advice.

The need for standards of practice is most apparent in connection with the regulation of public utilities and the establishment of safety codes. The studies made by the Bureau of Standards have been directed toward simplifying this problem by providing well-defined specifications as to what constitutes good service. The resources of the Bureau, however, are not sufficient to enable it to do all of even the most necessary work; some of the most important steps have not yet been taken up. It will obviously never be practicable for any State commission or city to handle these questions independently, though they possess a large building and engineering stations and employ specialists for each separate problem.

From the standpoint of uniformity, economy, and efficiency, it is desirable for the Federal Government to do a certain portion of this work. Therefore, the Bureau of Standards has been assisting in it as far as possible within the limits of its functions and its facilities. The success and approval with which the work has been met thus far adequately justifies its expansion.

Recommendations as to Buildings, Equipment, Personnel, and Special Investigations.

As in previous reports, attention is called to the necessity of properly housing the structural-material work, especially that branch of it temporarily located in buildings of the War Department at Pittsburgh. These buildings are entirely unsuited for the purpose either as to character or location. The Bureau has considered it unwise to expend any funds on their preparation as laboratories other than for the barest necessities. Furthermore, the War Department has repeatedly asked for the vacation of the building.

Although the Bureau is striving to place its structural-material work on the basis which its importance warrants, the funds available are barely sufficient to meet the needs of such testing as the Government itself alone requires. Considerable heavy equipment has, however, been accumulated both at Pittsburgh and Washington and more will be needed to make the plant complete. If this work is to be done as it ought to be, in view of the fact that every citizen is more or less directly interested in it, it is necessary that the large testing machines, furnaces, and other heavy apparatus should be assembled in a building designed for the purpose and of sufficient size to permit doing the work effectively.

There is greatly needed a large transverse testing machine capable of testing full-size plate girders, arches, floor constructions, and similar work. Our accurate knowledge of the laws governing the behavior of girders used in construction stops when we reach a moderate size. Beyond that point our knowledge is as yet imperfect. We do not certainly know what we are about. There is quite too much of guesswork and too little of determined fact. We ought not to wait for some accident to so disclose the limits of our knowledge that we shall, under the pressure of such circumstances, take the step which should be taken now.

I quote from my last report the words of the late Alfred Noble, one of America's most distinguished engineers:

The use of steel and concrete in girders in the construction of bridges and buildings is increasing rapidly. The calculations of strength of such girders are to a large extent based on theory, not well checked by actual tests; such tests as have been made were on small girders, and the value of the results in determining the dimensions of large girders, such as are now in common use, is doubtful. It is questionable whether, on the one hand, many structures in daily use are not perilously near the breaking point; or, on the other hand, whether the structures are not built unnecessarily massive and costly.

There is therefore great need of a large testing machine for actually testing the strength of girders of large size. Such a machine, operated under the direction of the Bureau of Standards, would soon repay its cost by inducing more economical and safer construction.

The recent opening of Van Ness Street north of the Bureau at a place not adjoining the Bureau's grounds makes it desirable to secure a small strip of land between that street and the Bureau's grounds on the north. It is also desirable to secure the narrow strip between the Bureau and Tilden Street on the south.

For the past three years the scientific and technical staff of the Bureau has not been increased except through the provisions of a few special funds. In the meantime its work has increased several fold and to such an extent that the Bureau is seriously handicapped in the performance of its duties. It is earnestly recommended that the scientific staff be increased in order to meet urgent existing conditions.

A special fund is also recommended for the purpose of determining the values of the more important physical constants. This fund need not be large, but should extend through a series of years sufficiently long to enable the Bureau to accomplish permanent results. Such data are exceedingly difficult to produce and involve much specially designed apparatus as well as the services of trained physicists and chemists who can devote their time exclusively and continuously to the work.

The testing of textiles by the Bureau of Standards for the year just closed included 33,000 separate routine tests and over 300 cooperative tests. About one-tenth of these were for the Government departments. Many special investigations have been undertaken; for example, on the effect of cotton compression in baling upon the spinning qualities of the fiber. Bales now run about 25 pounds per cubic foot. If cotton can be further compressed without injury to the fiber, savings could be effected in bale covers, transportation, warehouse charges, etc. Compression tests up to a density of 50 pounds per cubic foot will be made.

The Bureau has also investigated the subject of the cotton bunting which is now manufactured for making flags as a substitute for the more expensive wool bunting. Numerous laboratory tests were made which included strength, weight, and fastness of color to light, water, and chemical reagents. This cotton bunting was also subjected to actual service, or practical weather tests on the seacoast. In every instance where the cotton was

tested a wool sample was similarly treated, thus enabling a comparable examination of the two fabrics after treatment to be made. As a result of this investigation large quantities of cotton bunting are now used in the Navy and other departments.

The textile work of the Bureau includes the development of specifications for textiles; the testing of samples submitted by bidders as a basis for award of Government contracts for supplies; the testing of delivery on contract to check the compliance with specifications; the development of standard methods of testing; and miscellaneous research involving experimental work, physical measurements, and testing.

The Bureau's overtime record of the minor clerks and assistants (\$1,200 and below), who have stated duties and work on schedule, shows 3,569 hours' overtime, or 510 days (based on clerical working day). The record of the men above \$1,200, who give the greater part of the overtime service, is no longer kept. The last data show for the staff in the Washington laboratory 1,112 hours for one month. In general the staff has shown a marked readiness to meet exigencies. Overtime is willingly given, especially by those in the more responsible positions.

There is urgent need in the Bureau of Standards for an assistant to the Director, for an editorial clerk, and for a property clerk. The time of the Director is hampered with details of administration which prevent his giving to the large problems of the service the time and the attention that they need. The publications are growing in number and in importance, and it is impossible for them longer to be properly supervised as an incident in the work of busy men employed on other important matters.

A very large amount of valuable property exists in the group of buildings occupied by the Bureau for which the present organization does not provide a proper custodian. The request for a property clerk has been made before, but the matter has become one of such importance that it is renewed with special emphasis in the belief that the interests of the Government and the safe-keeping of its property require that this additional subordinate be supplied.

In concluding that portion of my report which deals with this great scientific service, it is proper to speak of the relation between the scientific staff of the Government and its naval and military staffs, and of the relation of the scientific staffs in our great universities to both, as respects pay, certitude of employment,

time allowed for vacation or study, opportunity for promotion, allowances, and other elements that affect employment.

The naval and military staffs of the Government are educated at a great public cost, are assured of permanent employment and of retirement upon a basis that assures protection in their old age. The scientific staff of the Government is no less productive. It is constantly consulted by the officers of the naval and military forces, and a cordial spirit of earnest cooperation exists between them. The man of science, however, whose research may provide the wireless telegraph or make possible the construction and operation of a great ship, who solves the problems of light and heat, develops explosives, and draws from out the recesses of nature the facts that all men utilize—the man of science, I repeat, pays for his own education, has no certitude of employment, and can look forward to no protection in his old age.

If the man of science desires the economic security which his work should provide, he must look outside of the Government for it. Though he serve the Government ever so faithfully, it does not extend to him the hand of helpfulness that the military or the naval officer receives.

Our young scientific men after leaving college start their professional work in our laboratories at \$1,000 or \$1,200 per annum, which makes an interesting comparison with the compensation awarded, for example, at the Naval Academy, plus a free education. If a young scientific man secures a sufficient standing in his science to enter our service at \$1,600, it is usually because he has at his own cost spent several years longer in a university in order to earn the degree of Doctor of Science. In a service like the Coast and Geodetic Survey, the men must devote the best years of their lives to working in all parts of the United States, Alaska, and the Philippines; must go to sea in small crafts and at the risk of storms and unknown dangers survey waters which through their own efforts are being charted for the first time. They must give up the home life which every man desires, and must endure hardships and dangers at least equal to that which any military service requires. It is not just that men of equal education and equal productiveness, assuming similar risks in the service of their country, should receive unequal treatment. The result of the present condition is that we are frequently losing able and trained men whose places can only be filled by those who are inexperienced, who in turn graduate into broader and safer fields of activity. The

practical attitude of the nation toward the men of productive science seems to be the very reverse of that which it holds to the trained officer of soldiers or sailors.

No comparison is drawn even in thought between these various groups of useful, unselfish public servants. There is no thought of exalting one above another. The comparison is between the way in which the Government treats one and the other and between the way the scientific man is welcomed in our industries and in our universities. He is not so warmly welcomed in the Government service, which needs him so much and which he serves so faithfully.

The men of science in the Government employ do much if not most of the basic work on which our economic structure, our transportation systems, and our industrial processes depend. They do not receive a commensurate reward.

BUREAU OF THE CENSUS.

The work of this important service was under the care of Hon. William J. Harris, of Georgia, until March 15, 1915. At that time he resigned pursuant to his appointment as a member of the Federal Trade Commission. His successor, Hon. Sam. L. Rogers, of North Carolina, was appointed Director of the Census March 16, 1915, and the work of the service has from that time been continuously in Mr. Rogers's care.

During the fiscal year this Bureau completed its decennial inquiry relating to wealth, debt, and taxation; issued its decennial reports on insane and feeble-minded, paupers, and Indians in the United States; published a decennial bulletin on Negroes in the United States and carried on the compilation of a detailed report on the same subject; completed and issued its decennial Statistical Atlas; completed its quinquennial census of electrical industries; conducted and brought well toward completion its quinquennial canvass of manufacturing industries; carried on its regular annual investigations relating to mortality, municipalities, and cotton and cottonseed; made its semiannual collections and publications of tobacco statistics; undertook a new line of work, the collection of financial statistics of States; took two special censuses of municipalities; and complied with numerous requests for information contained in its records.

PROGRESS OF ROUTINE WORK.

Census of Manufactures.

The largest single task of the past fiscal year was the quinquennial census of manufactures, taken as of December 31, 1914. After many months of preliminary organization a force of more than 1,300 special agents was assembled during December, 1914, to collect the statistics of manufactures throughout the United States. The preliminary work included the preparation of many schedules and of lists, as nearly complete as possible, of names and addresses of manufacturers throughout the country. The lack of an appropriation for the purchase of city directories from which to obtain this information caused some inconvenience and delay. Arrangements were, however, made to borrow directories

from mayors and other officials of some of the cities and to obtain them for other cities from the Library of Congress. This facilitated the work and resulted in a material saving.

An earnest attempt was made in the preparation for this important census to cooperate with chambers of commerce, boards of trade, and associations of manufacturers. Valuable suggestions were received from many bodies of this kind, both local and national. The Director and the Chief Statistician for Manufactures visited many important cities to confer with bodies of business men, and the schedules, when prepared, represented the combined thought of business bodies as well as that of the service itself.

The schedules were mailed to all manufacturers, and a large number were filled and transmitted by them through the mail to the Bureau ready for use. In this way over 50,000 schedules were received without any expense for field work in collecting them. As a result of this I had the pleasure of requesting the Committee on Appropriations of the Senate to reduce by \$40,000 the appropriation which had at that time passed the House of Representatives and was pending before the Senate committee. This reduction was accordingly made pursuant to my request.

In point of rapidity and accuracy, the record for this census of manufactures promises to be more satisfactory than that of any preceding one. Both the field and office work are much further advanced than at the corresponding date for the preceding similar census. Already a large number of press summaries have been issued giving statistics for individual cities.

The lack of suitable office accommodations arising from the congestion in the Commerce Building because of the assignment required by law of a considerable space to the Federal Trade Commission has been a serious obstacle to the successful conduct of the manufactures work. The force of the Manufactures Division had at times to be assigned to work in rooms used for storage purposes, thus removing them from proper administrative control and preventing them from working to the best advantage. This condition was not remedied until large numbers of the force left for the field work.

As the report of the Director shows, the work of the Census Bureau requires more room. It is earnestly desired, therefore, that the request of the Federal Trade Commission for its own quarters be granted in order that we may avail ourselves of the space now occupied by it. Failing this, the question will arise either of stopping or delaying a long time the work of the Census

or of providing additional quarters for some of its work. The Census service was moved to the Commerce Building at a great saving to the Government, but it was never contemplated when this was done that by law there would be quartered in the building, against the protest of the Department, an additional service then not existing. This latter service, the Federal Trade Commission, joined with the Department in urging that it be provided quarters elsewhere. The request being refused, embarrassment all around has existed ever since and will exist until a change is made.

Electrical Industries.

The compilation of the quinquennial census of electrical industries, relating to the year 1912, which covered central electric light and power stations, street and electric railways, telephones, telegraphs, and municipal electric fire-alarm and police-patrol signaling systems, was completed early in August, 1914. The detail work in connection with the printing of the reports consumed so much time that they were not issued until April, 1915. Two volumes were published, the first relating to central electric light and power stations and street and electric railways, and the second to the remaining subjects named.

Wealth, Debt, and Taxation.

The decennial investigation of wealth, debt, and taxation was completed during the fiscal year. The results were published in the form of eight separate bulletins and an abstract. After the issuance of the entire series of bulletins, their contents were bound together in two volumes having a total of 1,642 pages. The final copy was sent to the printer on March 15, 1915—less than a year and a half from the beginning of the office work and about a year from the commencement of the field canvass. This establishes a record for rapidity of work.

Financial Statistics of Cities.

The preparation of Bulletin 126, presenting these statistics for the fiscal year 1913, was completed July 30, 1914, and the bulletin was issued in the following September.

The field work on the current investigation under this head, which relates to the latest fiscal period terminating prior to July 1, 1915, was begun early in 1915 and is being rapidly completed. It is purposed to have the results of this inquiry in the hands of the printer by December 15 or January 1, which will be nearly a year earlier than most similar reports have heretofore been sent to the printer.

General Statistics of Cities.

This investigation covers form of government, police departments, water-supply systems, and liquor licenses and taxes, as fully detailed in the report of the Director of the Census. Prior to and including 1909 general statistics of cities had been collected biennially, but this inquiry was not made in 1911 and 1913. The present inquiry relates to the fiscal year 1915 and is carried on in connection with the collection of financial statistics of cities, embracing the same municipalities and made by the same force.

Cotton and Cottonseed.

During the year the Census Bureau gathered and published statistics relating to cotton ginned, consumed, imported, exported, and on hand, and active spindles, and to cottonseed and linters. Notwithstanding the unusual difficulties attending the movement of the crop of 1914, there was no delay in the collection and publication of the data. All of the reports were published on dates corresponding with those on which they were published in preceding years.

Special attention is called to the consumption of linters for the manufacture of explosives. There is no definite provision of law for the collection of statistics in regard to linters, but the Bureau has acted on the theory that linters form a part of the cotton crop, and the data concerning them are collected in connection with statistics relating to the quantity of cotton ginned.

The Bureau of the Census also gathers statistics respecting the quantity of cottonseed crushed, but this is done incidentally to collecting data concerning cotton ginned. No direct provision of law requires an inquiry into cottonseed and cottonseed products.

It would assist the Bureau in carrying on this work if there was a provision of law requiring the Director of the Census to collect statistics of the quantity of cottonseed crushed and linters obtained and of the distribution of linters.

Tobacco.

Under authority of an act of Congress approved April 30, 1912, the Bureau makes semiannual collections and publications of statistics of stocks of leaf tobacco held by manufacturers and dealers. The reports for the fiscal year 1915 related to October 1, 1914, and April 1, 1915, and were issued November 9, 1914, and May 5, 1915, respectively.

Three other Federal bureaus—namely, the Bureau of Internal Revenue of the Treasury Department, the Bureau of Crop Esti-

mates of the Department of Agriculture, and the Bureau of Foreign and Domestic Commerce of the Department of Commerce—also collect and publish statistics relating to tobacco. In order to avoid the duplication necessarily resulting from this state of affairs, to systematize the work, and to make it possible to publish an authoritative report concerning the production, consumption, and stocks of tobacco, an interdepartmental committee was appointed to consider the entire subject. The report of this committee included a recommendation for the repeal of the act of April 30, 1912, which recommendation has the approval of this Department. The Bureau of Internal Revenue is arranging to collect statistics quarterly concerning the stocks of tobacco carried by all dealers and manufacturers. These will be more reliable than the data collected by the Bureau of the Census, which relate only to stocks carried by certain classes of manufacturers and dealers. There is no necessity for duplicating this work, and the facts gathered by the Bureau of Internal Revenue will serve every public purpose well.

The full report of the committee is given in the annual report of the Director of the Census.

Vital Statistics.

The annual report, Mortality Statistics, 1913, and the Index of Joint Causes of Death were completed and published during the fiscal year. The work on the report for 1914 is progressing satisfactorily, and it is expected that this report will be ready for the printer soon after January 1, 1916.

Life, or Mortality, Tables.

These tables, which show the expectation of life for various elements of the population of certain States, are being compiled under the supervision of Prof. James W. Glover, of the University of Michigan. It is expected that they will be ready for the printer by February 1, 1916.

Dependent, Defective, and Delinquent Classes.

During the fiscal year the Bureau issued reports on the insane and feeble-minded, and on paupers in almshouses, and since the close of the year a bulletin relating to the blind population of the United States has been issued. The complete report on the blind, and also one on the deaf and dumb, are in preparation. Work is also being done on the investigation relating to prisoners and juvenile delinquents. A bulletin on this subject was pub-

lished prior to the beginning of the fiscal year, but the full report has not yet been issued. These publications, which are issued decennially, are based in part on data obtained at the last census of population and in part on statistics gathered by correspondence.

A summary of State laws relating to dependent, defective, and delinquent classes was prepared during the first half of the fiscal year and was issued in December, 1914.

Negroes in the United States, 1910.

A bulletin with this title has been issued, and work is proceeding on a detailed report on the same subject. This will show the growth of the Negro population from 1790 to 1910, inclusive, and its geographical distribution, migration, dispersion and segregation, marriage and divorce, fecundity, intermixture with whites, mortality, educational progress, occupations, agricultural conditions, economic progress, religious affiliations, criminality, insanity, and pauperism.

Indians in the United States, 1910.

The work on this report, which is based largely on data contained on the special Indian schedule used at the Thirteenth Census, was discontinued in February, 1912, because of the large reduction in the temporary Thirteenth Census force, and little more was done on the report until the close of April, 1914. A bulletin embodying the results of the work already done, however, was issued in June, 1913. The last section of the report was released for printing in October, 1914. There was considerable delay, however, on account of the limited force of clerks available for this work, in getting the checking and proof reading done. The report was finally issued on July 3, 1915.

This report covers 12 subjects, namely, population, stock and tribe, blood, sex, age, marital condition, school attendance, illiteracy, inability to speak English, occupations, fecundity and vitality, and Indians taxed and not taxed.

Occupations.

An Index to Occupations, alphabetical and classified, has been prepared for the official use of the Census Bureau and other Federal offices as well as for the use of State bureaus and of associations, societies, institutions, etc., which may desire to classify occupations in conformity with the classification employed by the Bureau of the Census. It shows in alphabetical order the

more than nine thousand occupational designations given in the Thirteenth Census report on occupations and classifies these designations into the 428 occupations and occupational groups listed in that report.

Work was done in preparation of supplementary occupation statistics, showing certain details not brought out in the general report on occupations. This work, however, was suspended early in October, 1914, in order to advance the work on the census of manufactures, and has not since been resumed.

Statistical Atlas, 1914.

The compilation of this publication was completed before the close of the calendar year 1914, and the atlas was issued in January, 1915. This volume, which is published decennially, presents a great number of maps, charts, and diagrams showing in graphic manner the more important results of the various census inquiries.

Official Register of the United States.

The compilation of the Official Register of the United States is progressing satisfactorily, and it is expected that this publication will be ready for distribution in December, 1915.

NEW WORK UNDERTAKEN DURING THE YEAR AND SINCE ITS CLOSE.

Financial Statistics of States.

The collection of financial statistics of States, similar in scope to the financial statistics of cities which are annually gathered by the Bureau, was authorized by me on June 20, 1915, and the work was immediately begun. The data obtained in this investigation will cover for each State its latest fiscal period terminating prior to July 1, 1915, and it is purposed to have them ready for distribution in January, 1916. Legislation will be necessary to provide for the subsequent annual collection of this information.

Censuses of Tulsa, Okla., and Hamtramck, Mich.

A special census of Tulsa, Okla., was taken in April, 1915, at local request and expense, upon direction of the President. This census established a precedent in that it was the first Federal enumeration of the population of a city, separately from that of the State in which it is located, ever made between decennial census years. A similar census of Hamtramck, Mich., was taken in June, 1915.

Monograph on Cancer.

A statistical monograph on cancer, relating to the calendar year 1914, is being compiled and will probably be ready for the printer by the close of the present calendar year. In addition to showing the number of deaths from cancer throughout the registration area and in each of its subdivisions, this monograph will present information of a more detailed character than that given in the Bureau's annual report on mortality.

Directory of Institutions.

The Census Bureau is preparing for publication a statistical directory of State institutions for the care or custody of defective, dependent, and delinquent classes.

PLANS FOR FUTURE WORK.**Marriage and Divorce.**

The first Federal investigation of marriage and divorce as a distinct subject was made by the Department of Labor and covered the 20 years from 1867 to 1886, inclusive. The next was made 20 years later by the Bureau of the Census and covered the period from 1887 to 1906, inclusive. Each of these investigations was specifically authorized by Congress, but no provision was made for future inquiries relating to this highly important subject. No argument is needed to demonstrate the desirability of making this inquiry at regular intervals. Legislation is therefore recommended authorizing the decennial collection of statistics of marriage and divorce, beginning in 1917.

Decennial Census of Water Transportation.

It will be necessary during the latter part of the fiscal year ending June 30, 1916, to prepare schedules and organize a field force for the decennial census of water transportation, which will relate to the calendar year 1916.

Monograph on Tuberculosis.

A statistical monograph on tuberculosis relating to the calendar year 1915 will be prepared. This monograph, like that for cancer, will show, in addition to the number of deaths from tuberculosis in the registration area and in each of its subdivisions, various detailed statistics not given in the regular report on mortality.

Religious Bodies.

The next decennial census of religious bodies will relate to the calendar year 1916. Some preliminary work on this investigation has already been done, and further preparations will be made as rapidly as possible.

Child Labor.

The Bureau expects, if the pressure of other work is not too great, to issue a bulletin on child labor, based on the occupation statistics of the Thirteenth Census.

Supplementary Studies of Occupation Statistics.

It is hoped to supplement, as opportunity offers, the occupation statistics heretofore published in Volume IV of the Thirteenth Census Reports. The Bureau is receiving many inquiries for a further development of these occupational facts, and they not only will have value in themselves but will furnish a basis for comparison with the occupation statistics derived from the census of 1900 and with those which will be obtained at future censuses. Details are given in the report of the Director of the Census.

Forest Products.

The annual collection of statistics of forest products should be authorized. Such statistics were collected by the Census Bureau in cooperation with the Forest Service of the Department of Agriculture for the years 1907 to 1912, inclusive. The work was discontinued by reason of the absence of any specific provision of law authorizing it. The statistics for 1914 have been collected in connection with the quinquennial census of manufactures, but in the absence of legislation it will be impossible to collect them for 1915 or any subsequent year in which a census of manufactures is not taken.

These statistics are very useful and are in great demand. The Forest Service of the Department of Agriculture has requested that the annual work be renewed, and has recommended legislation to that effect.

Children Born and Living.

An important special tabulation which the Bureau of the Census is planning to make in the near future will show, for various race and nativity classes and age groups, for urban and rural localities, etc., the number of children borne by women enumerated at the last census, and the number still living on the census date.

LEGISLATION NEEDED.

Legislation should be enacted providing for the annual collection of statistics of forest products, of cottonseed and cottonseed products, and of State finance, and the decennial collection of statistics of marriage and divorce. The desirability of this legislation has already been set forth.

The changes in the scope of the Official Register which are recommended in the annual report of the Director of the Census should be authorized by law.

The requirement of the decennial collection of statistics relating to the business of express companies, now contained in the act of June 7, 1906, should be repealed. Annual statistics of this character are collected and published by the Interstate Commerce Commission, and the decennial conduct of a similar investigation by the Census Bureau is unnecessary.

The act of April 30, 1912, requiring the Bureau of the Census to make semiannual collection and publication of statistics of stocks of leaf tobacco held by manufacturers and dealers should be repealed, as hereinbefore explained.

Express, rather than implied, authority should be given the Director of the Census to furnish transcripts of tables and other records and to prepare special statistical compilations for State officers and private individuals, and the provision should be so drawn as to make the amounts received for work thus done for outside parties actually serviceable to the Bureau, instead of only nominally so as at present. The authority under which the Bureau now performs this work is found in section 32 of the Thirtieth Census act.

OFFICE FORCE.

The appropriation act for the fiscal year 1915 provided for 589 permanent officials and employees of the Census Bureau. The number provided by the act for 1916, under which the Bureau is now operating, is 569.

The Census Bureau is seriously handicapped in carrying on its work, not only by reason of the inadequacy of its force at times, as during a quinquennial census of manufactures, but also because of its exceedingly low average salary scale. The percentage of the Bureau's force receiving more than \$1,200 per annum as provided for by the current appropriation act is only 14.8. This percentage is a trifle more than three-fifths as high as for the other bureaus and offices of the Department of Commerce taken

as a group and is much lower than that for any other individual bureau or office of the Department. It is also much lower than the corresponding percentage in nearly all bureaus and offices in the other executive departments. This state of affairs results in the loss to the Bureau of many of its most valuable employees, who are able to obtain higher salaries elsewhere, both in and outside the Government service.

The service lost in the last fiscal year 34 clerks by transfer to other offices, and 1 official and 15 clerks by resignation.

It is impossible to lay too great stress on the unfortunate results of this indefensible state of affairs. On the one hand, the Bureau has lost a considerable number of its most valuable and efficient employees—men and women whose places can not be adequately filled by the simple process of promotion or appointment—and has thus become, to that extent, a training school for other bureaus with more liberal salary scales. On the other hand, the employees who remain are, in many cases, drawing far less pay than is given for comparable service in other bureaus in this and other departments. From the standpoint of the employees this is unjust, and from the standpoint of the Bureau it is a disadvantage in that it naturally tends to engender a spirit of discontent and indifference.

It can not be too plainly stated that the conditions imposed by law upon the Census service are such as to prevent its operating with the effectiveness the Director earnestly desires. The facts are fully stated in the report of the Director of the Census, who fully coincides with his predecessor in this important matter, and whose report has my approval.

In the hope of remedying this state of affairs, it is the intention of the Bureau to present for consideration by Congress a plan for the readjustment of salaries in the present salary classes of \$1,800, \$1,600, etc., so as to increase the number of high salaries and reduce the number in the \$1,200 class, which is now proportionally too large. This plan can be put in force without any increase in the appropriation.

It should be noted here that the Bureau's statutory force for the fiscal year 1916 is but 569, whereas 10 years ago (1906) it was 691, or 122 more than the present number. A portion of this reduction (32 employees) is due to the removal of the Census Bureau to the Department of Commerce Building and the consolidation of a part of its force with that of the Department. Apart from this, however, the service is operating with 90 fewer

employees than it had 10 years ago. Then, as now, the Bureau was taking a census of manufactures. Since 1906, however, two new lines of work have been given the service, viz, the biennial compilation of the Official Register and the semiannual publication of tobacco statistics. Furthermore, every other element of work is much greater than 10 years ago by reason of the growth of the country in that time. It is the fact, therefore, that the Bureau of the Census is doing more work to-day with a smaller force than it did 10 years ago, and this force is working under conditions which do not permit its highest efficiency. For these conditions neither the Bureau of the Census nor the Department of Commerce is responsible. They are the result of law. That law should be changed. The Census Bureau has been able by improved methods and mechanism to neutralize in part the above-named disadvantages. Its difficulties are nevertheless grave and their seriousness increases.

EQUIPMENT.

At the present time the Bureau does not possess a sufficient number of typewriter tabulating machines or adding and calculating machines to meet the requirements of the manufactures work. Its supply of desks, chairs, and filing cases is inadequate; in fact, in only one division is the equipment of this character sufficient to meet properly the needs of the daily work. Twenty-five additional automatic tabulating machines will be required, and the sorting machines must be thoroughly overhauled. The automatic punching machines must be both overhauled and remodeled.

A new-model tabulator head has been constructed in the machine shop which has advantages over former models. It has been in use for several months in tabulating mortality statistics and has operated well.

It is necessary now to look forward to the taking of the Fourteenth Census in 1920 if that work is to be done in the most effective and economical manner. There has been in the past just public criticism of some of the delays in publishing the results of the Census work; but the fact must not be overlooked that a great part of the results is printed and distributed in bulletin form many months, or even a year or two, before the bound volumes constituting the final reports are issued. However, the furnishing of even a part of those results to the people several years after their immediate usefulness has passed can hardly be commended as good practice.

This, however, is hindsight, and foresight is what is now needed. Such foresight has in this case its normal bearing in connection with the machine shop and machine equipment of the Census service. There follows a statement showing the cost of tabulating machines and of machine-shop operation and equipment from July 1, 1905, to June 30, 1916, in comparison with the cost of doing the mechanical tabulating work of a single decennial census through an outside contractor.

Cost of tabulating the Twelfth Census (1900) on rental basis (Hollerith Co.).....	<u>\$462,799.24</u>
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Cost of equipping and operating mechanical laboratory and of machines made therein during 11-year period 1905-1916:

July 1, 1905, to June 30, 1906 (tabulating statistics).....	\$9,068.87
July 1, 1906, to June 30, 1907.....	29,000.00
July 1, 1907, to June 30, 1908 (appropriation).....	30,000.00
July 1, 1908, to June 30, 1909.....	<u>29,849.89</u>
July 1, 1905, to June 30, 1909.....	\$97,918.76
Thirteenth Census (1910) period (July 1, 1909, to June 30, 1912):	
Salaries for machine shop.....	118,254.63
Tabulating machines and parts.....	60,361.67
Punching machines and parts.....	80,286.12
Machine-shop supplies, tools, etc.....	<u>39,142.73</u>

Expenditures during Thirteenth Census period..	<u>298,045.15</u>
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Expenditures to June 30, 1912.....	395,963.91
July 1, 1912, to June 30, 1913.....	26,595.12
July 1, 1913, to June 30, 1914.....	26,570.92
July 1, 1914, to June 30, 1915.....	11,876.58
July 1, 1915, to June 30, 1916 (appropriation).....	<u>12,000.00</u>

July 1, 1912, to June 30, 1916.....	<u>77,042.62</u>
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Total expenditures.....	<u>473,006.53</u>
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It will be noted that the mechanical laboratory cost from July 1, 1905 (its beginning), to the end of the Thirteenth Census period, \$395,963.91. This represents tabulating 430,000,000 cards and sorting 745,000,000 cards. If these had been tabulated and sorted under the arrangement existing prior to the installation of the Bureau's own machines, the tabulating at 65 cents per thousand would have cost \$279,500, and the sorting at 20 cents per thousand, \$149,000, or a total of \$428,500, compared with an expenditure of \$395,963.91, which represents the total maintenance of the mechanical laboratory. If the office could have

had cards tabulated for 50 cents per thousand and sorted for 15 cents per thousand, as it attempted to do, the cost would have been \$326,750. Assuming that the Bureau could have entered into an arrangement splitting the difference between the price asked by the contractor and what the office wished to pay, the cost of tabulating during the Thirteenth Census would have been \$377,625. To this sum should be added, for the purpose of comparison, tabulating work done during the 11 years from 1905 to 1916, principally in the Division of Vital Statistics, which would have amounted to \$6,000 or \$8,000 per annum on a rental basis. Allowing \$66,000 as the minimum total cost of this work, the total expense of tabulating the Thirteenth Census and of doing the vital statistics and miscellaneous tabulating work of the Bureau, on the basis of the arrangement referred to, would have been \$443,625. This amount is comparable with \$473,006.53, the cost of the mechanical laboratory during the 11-year period. The latter figure exceeds the former by \$29,381.53, an amount which represents less than half the value of the machine-shop equipment and tabulating machinery owned by the Bureau. It is obvious, therefore, that the Government has saved largely by making its own machines.

This excellent result can be bettered if the mechanical laboratory is provided now with the funds it needs to prepare the new machines for the work of the Fourteenth Census so that they shall be completed and ready for use when that work begins. This work is of a kind which can not be hurried. It can not be made the subject of a rush appropriation at the last minute. If that is done, there will be serious loss of money and danger of confusion of work. What is spent now in careful preparation of the mechanical apparatus needed will be returned manyfold.

I have therefore included in the estimates \$30,000 as the first of four annual allotments requisite to bring the work of the mechanical laboratory up so that the mechanical equipment of the service shall be ready when the stress of the Fourteenth Census work falls upon it.

Reference is made to the appendixes of the report of the Director of the Census for details as to publications issued during the fiscal year, for the report of the interdepartmental committee on tobacco statistics, heretofore mentioned, for details of the proposed change in the distribution of appropriations for salaries, and for a statement showing the nature and distribution of

the office and field forces of the service on September 30, 1913. The following is a summary of the Census force on that date:

Officials.....	17	Special agents (general force)....	20
Clerical.....	534	Special agents (temporary force)....	141
Subclerical.....	20		—
Machine shop.....	6	Total.....	749
Special agents to collect statistics of cotton			749

The Director's report also contains a statement of the appropriations and expenditures for the fiscal year 1915.

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BUREAU OF FISHERIES.

The Deputy Commissioner of Fisheries, Dr. E. Lester Jones, resigned April 14, 1915, to accept the appointment of Superintendent of the Coast and Geodetic Survey on April 15, 1915. Dr. Henry F. Moore, who has been since July 7, 1896, actively connected with the Fisheries Service, was promoted to the post of Deputy Commissioner of Fisheries to succeed Dr. Jones.

The old building in which the Fisheries Service is housed has lasted one year more and changes have been made on the lower floor which provide more office room, an enlarged tank for the live seals, and give a much more attractive appearance to the venerable structure. It is, however, wholly unfit for its purpose and of more value as a historical relic than anything else. Almost 60 years ago it was an armory. After 20 years it became a storehouse. Four years later it was used as a fish hatchery. The manager of an industrial plant who permitted it to continue in the service to which it is put would probably be discharged for incompetency. I renew the recommendation made earlier in this report that the administrative portion of the Fisheries Service be combined with the rest of the Department in a new Government building, and that a suitable working aquarium be provided for the study and development of the important food supply the Fisheries Service has under its care.

Propagation of Food Fishes.

Although the fiscal year 1914 was in general the most successful in the history of fish culture in the Federal Government, the year ended June 30, 1915, excelled it in every respect—the number of fish produced and distributed was much larger, the quality was better, the cost per million was less. The cost of fish produced and planted was \$403 per million in 1894, \$287 per million in 1904, \$136 per million in 1914, and but \$131.55 per million in 1915.

During the past fiscal year the Bureau conducted fish-cultural operations at 50 permanent hatcheries and 76 subhatcheries, auxiliaries, and egg-collecting stations. The regular hatcheries fall naturally into five categories, as follows: Atlantic rivers, for salmon, smelt, shad, striped bass, white perch, and yellow perch, 5; Pacific rivers, for salmon and steelhead, 12; Great Lakes,

for whitefish, cisco, lake trout, and pike perch, 5; interior waters, for basses, sunfishes, crappies, and trouts, 25; and Atlantic coast, for cod, haddock, pollock, flounder, and lobster, 3.

The aggregate output during the fiscal year 1915 was 4,288,757,804 fry, fingerlings, yearlings, adults, and eggs, the last being transferred to the State fish commissions for incubation in local hatcheries. This output was about 241,000,000 in advance of the previous year, the increases being among the whitefish, cisco, chinook and dog salmons, lake and brook trouts, black basses and crappies, pike perch and yellow perch, cod, flounder, and lobster. Among the fishes of which there was a reduced output are the blueback and humpback salmons, shad, haddock, and pollock. Most noteworthy and most serious of the cases of diminished production is that of the shad in the Chesapeake basin, where the hatcheries were practically put out of commission because the fish could not reach their spawning grounds on account of impassable barriers of nets in Chesapeake Bay and at the mouths of the rivers. The shad-fishing industry of Maryland and Virginia is being steadily destroyed. It is hardly worth while longer to run the hatcheries at Havre de Grace (Susquehanna River) and Bryans Point (Potomac River).

Plants of food fishes were made in every State and Territory in rivers, large lakes, and other public waters, and in numerous small lakes, ponds, and streams. Most of the plants in minor waters were on farms. It has been demonstrated that an acre of water on a farm may be made equal to an acre of the best land for producing food, and the Fisheries Service is endeavoring to stock the minor ponds, natural or artificial, in order to distribute fish food as widely as practicable over the interior of the country. The Bureau stocks these small ponds with suitable food fishes without expense and instructs the farmer in their care. A manual of fish culture on farms is in preparation.

Fish and eggs were distributed to the fish commissions of 27 different States, a list of which with the allotment to each appears in the report of the Commissioner of Fisheries. Over 518,000,000 eggs, over 5,000,000 fry, and over 400,000 fingerlings and larger fish were thus distributed. Consignments of various fishes were also made to Porto Rico, Cuba, India (rainbow trout), and Japan (rainbow trout).

The distribution of the output required over 146,000 miles of travel by the five special cars of the Bureau and 491,000 miles by

detached messengers. All transportation was paid for except 116,665 miles which was donated by certain railroads.

Under the act appropriating \$20,000 for an additional fish-transporting car, a contract was made on April 29, 1915, for the construction of a new steel car of improved design. This is an adaptation of but an improvement over the wooden cars used for the past 25 years. The entire car, including all interior bulkheads, partitions, doors, berths, lockers, and water tanks, is of steel. It has a length of 60 feet $\frac{1}{2}$ inch over ends of body plates, and a standard width of 10 feet. The weight of the car with equipment will be 150,000 pounds, and it is designed to carry a load of 35,000 pounds, including water, fuel, ice, and other supplies, making its total weight when loaded 185,000 pounds, or 92 $\frac{1}{2}$ tons. The car is especially designed for carrying live fish long distances. In the center, running lengthwise on each side, is a line of insulated tanks with a capacity for 130 10-gallon cans in which to transport fish. These tanks will accommodate 10,000 to 15,000 fingerling bass, 65,000 trout of 2 $\frac{1}{2}$ inches, 6,500,000 shad or whitefish fry, and 25,000,000 pike-perch fry. During transportation the fish will be furnished with oxygen and fresh water by means of air and water pumps, which will be operated by a 6-horsepower steam boiler which also furnishes heat to the car. In addition to this independent heating system, the usual train attachment for heating the car from the locomotive is provided for. Tanks for carrying a reserve water supply are located beneath the car, and an ice box to hold 1 ton of ice is installed. In addition to the facilities for the transportation of fish, the car will be fitted with living accommodations for a crew of five men, a cook's galley, an office, and space for a dining room. When completed this car will be detailed on the regular distribution work of the Bureau, which embraces every section of the United States excepting Alaska. This car will be finished and put into service during the winter of 1916. It is intended that this new car, the finest in the world for its purpose, shall in the course of its regular duties be open to public exhibition in the principal cities it may visit in order that all persons interested may have as full a chance as possible to see the nature of its work and the means for performing it.

The planting of the humpback salmon of the Pacific in the waters near the coast of Maine, which was mentioned as an experiment in my last report, has proven successful. Numbers of these fish have been taken during the summer of 1915 in the Maine rivers and eggs have been secured in the best possible

proof of the success of acclimatization. The growth of these fish has been so rapid that some persons are skeptical about them, not understanding how a fish can come in two years to be $7\frac{1}{2}$ pounds in weight. This species of salmon, however, was selected for that reason, and the laws of nature provide that it shall attain its full maturity, spawn, and die on or about its second birthday. It is the shortest lived of all the Pacific salmon, but not the less useful on that account. The Atlantic salmon in the Penobscot River, the only stream that has this fish in noteworthy numbers, seems to be holding its own under very adverse conditions.

Sufficient time has not elapsed to determine the extent to which the experiment in transferring Atlantic lobster to the coast of the Pacific Northwest has been successful. Another carload will shortly be sent forward and no facts have come to light throwing doubt upon the success of the matter.

More than once damage has been done by stocking waters with fish that are unsuitable for them. With the best of intentions demands have been made and strongly urged, the granting of which would mean the destruction of valuable native fish. Many fish are cannibals and the introduction of a swifter and stronger cannibal into a pond tenanted by other desirable fish can have but one result. The cannibal survives. It is the policy of the Service, therefore, to which strict adherence is given, that applications for fish for stocking purposes will not be granted when it is known that injury to other valuable native fishes will follow. To plant spiny-finned game fishes from eastern waters in salmon and trout waters of the Pacific States would simply mean destruction. The Fisheries Service is gratified by the approval given this policy by the fisheries authorities and commercial organizations of the Western States. It should be upheld by all who have regard for preserving the native food fishes in every part of the land.

The urgent needs of the fish-cultural service are as follows:

(a) The placing of the segregated field operations under district inspectors or field superintendents, so that frequent inspections of the hatcheries may be possible and increased economy and efficiency may result through closer coordination and cooperation. The experience in the Pacific coast district, where a field superintendent is provided, shows the desirability of extending this work to all parts of the country. It will result in larger food production at lower cost.

(b) The substitution of all-steel fish-transportation cars for the remaining four wooden ones, which are worn out and obsolete. Modern traffic regulations demand steel cars. The old wooden cars are no longer safe and their use should be discontinued as rapidly as new ones can be built to replace them. Meanwhile the demand for the use of these cars is growing and the mileage traveled in distributing fish increased during the last year over 1,300 miles per month and averaged over 12,200 miles monthly.

(c) A stanch seagoing motor boat for each of the two remote salmon hatcheries in Alaska, where only small open boats are now available. These are required for the proper conduct of the existing fish-cultural work, for the transportation of supplies, and for the extension of operations into promising adjacent fields now beyond reach.

(d) The establishment of a lobster-rearing plant in connection with the marine fish-cultural operations. All authorities on the lobster agree that the results from lobsters reared to beyond the free-swimming stage are infinitely greater than those from lobster fry. The plant is not expensive, and the methods of rearing are now so well worked out that the Department is not justified in failing to take this important step.

(e) Authority to discontinue at least one station where the output does not justify the cost of maintenance and where, on account of a changed condition of the water supply, there is no probability of improving matters. It is not proposed to abandon hatchery work in any given State, but to relocate at some suitable place and dispose of the old property to the best advantage.

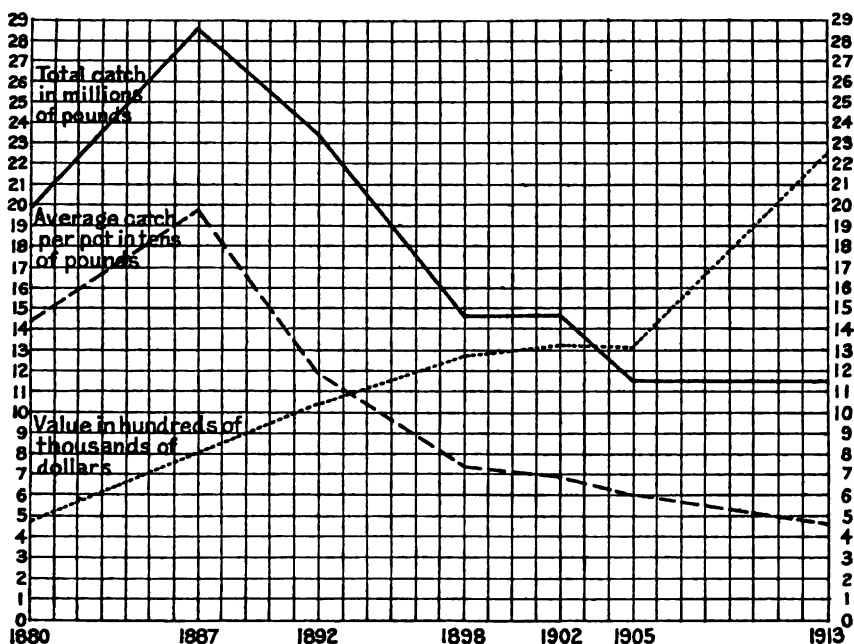
(f) The establishment of a limited number of new hatcheries in selected fields, especially in Alaska, where the Government is responsible for the welfare of the fishing industry.

The very extensive operations connected with the artificial propagation and distribution of food fishes are going far to maintain the supply, but in nearly every field there is need for increased output to meet the annually increasing consumption. This need is being met in part by greater efficiency in fish-cultural methods, by the occupation of new fields, and by small additions to the number of existing hatcheries; but it is evident to all who have given the subject thoughtful consideration that the situation, from the standpoint of the Federal Government, demands a further increase in fish-cultural work in various sections, as, for instance, the lower Mississippi Valley, the great southwestern region, and the Pacific coast.

The Fishing Industry.

Many branches of the fishing industry of the United States are in a satisfactory condition and some of the more important are flourishing. Several branches are causing the Department much concern because of their downward trend and the apparent inability of the States to meet the situation.

Among the most valuable products of the Atlantic coast waters is the lobster, which supports an industry in all the States from Maine to Delaware. The supply in the regions of greatest abundance has steadily declined in recent years, and even the dimin-



ished catch has been made possible only by the use of larger quantities of apparatus and by the inducement for increased exertion on the part of fishermen afforded by inflated prices. In the 24 years ended in 1913, the United States lobster output decreased 60 per cent in quantity but increased 178 per cent in value to the fishermen. A graphic history of the lobster fishery for various years between 1880 and 1913 is shown in the diagram above.

The causes for this decline are well known and fully appreciated throughout the lobster-producing States. The conditions are what would naturally be expected from eight separate jurisdictions combined with inharmonious laws and with flagrant

disregard for laws and for the welfare of the lobster industry among elements of the fishing and general coastwise population. Artificial propagation by Federal and State Governments has not been adequate to maintain the supply under these circumstances, and most radical action, forced and sustained by an awakened public sentiment, is now required.

A conference called by the Secretary of Commerce of officers having charge of the fisheries in the eight lobster-producing States, to consider the condition of the lobster fishery, met at Woods Hole, Mass., early in July, 1915. Its main object was to consider the relations of the Bureau of Fisheries to the lobster industry, the obligations resting on the Federal Government in connection with the maintenance of the lobster supply, the effect of varying State laws upon that supply, and what was requisite in the way of cooperation between the States and the National Government and between the States themselves to maintain the supply. Resolutions adopted by the conference clearly pointed out the path which the States must pursue in order to arrest the decline, and emphasized the necessity for greater efficiency in artificial propagation to be secured through rearing the baby lobsters beyond the free-swimming stage. It is believed that good will result from the conference, and the Department has shown its willingness to help by asking Congress for authority to establish a lobster-rearing plant.

The most valuable of the migratory river fishes of the Atlantic seaboard is the shad. It is taken for market in every coast State from Florida to Maine, and since colonial days has contributed largely to the food supply and wealth of the country. The question is now being seriously asked whether the shad is destined to go the way of the sturgeon. The Department has repeatedly sounded the note of alarm, and has pointed out the shortsighted and destructive course pursued by some of the States with reference to this most important fish. The most serious condition exists in the Chesapeake basin, where, in 1915, the fishery was the poorest ever known, following a season that was the poorest in a generation. The shad, coming in from the sea on its way to the spawning grounds in fresh water, receives no protection other than that afforded by the laws requiring certain channels or ranges to be kept open for the passage of vessels and boats. No limits are placed on the operations of the fishermen, who seem blinded to their own interests; every stream which the shad can try to ascend is literally choked with nets; and only a pitiable remnant

of the schools that run in from the sea in spring reaches the spawning grounds. Shad hatcheries built, maintained, and operated by the Federal Government at great expense have practically been put out of commission by the inability to obtain eggs for hatching purposes, and a calamitous failure of the crop in the near future may be expected as a result of the present foolish policy or absence of policy. The livelihood of many is being needlessly destroyed and the food of more is being taken out of their mouths.

The Bureau made a comprehensive canvass of the shad fishery of Chesapeake Bay and tributaries in 1915, and now has data on which to base a final appeal for proper treatment of the shad. Failing to secure adequate legislation, the next step must be the abandonment of fish-cultural work in localities where it is not appreciated and the concentration of effort in communities where the maintenance of the fish supply is regarded as a serious function of the State.

The pearl-button industry can not get along without the fresh-water mussel, and the mussel fishery, which is carried on in the streams of the entire Mississippi Valley, depends largely for its output and operation upon the regular output of the Fairport (Iowa) Biological Station of the Bureau of Fisheries. The fresh-water mussel starts life as a parasite in the gills and on the fins of fishes, and the Fairport laboratory makes it a part of its business to infect fishes with these parasites. In the fiscal year 1915 over 345,000,000 larval mussels were thus planted in the Mississippi River and its tributaries in Iowa, Wisconsin, Indiana, and Arkansas. To do this more than 207,000 fishes were infected and then liberated. Over 50,000 of these fishes were rescued from overflowed lands. Thus these latter fishes were not only saved, but they were put to work distributing the young mussels through the whole basin of the Mississippi River. The parasite does the fish no harm. The fish merely acts as a means of cheap transportation for the mussels to the places where they mature and become useful to commerce. This work is now in its third year and its utility is beyond question. In it the science of biology is made the basis on which is founded a practical fishery of large importance, on which in turn an important manufacturing industry depends. This industry is comparatively new in this country. Formerly our whole supply of pearl buttons came from abroad. A little parasite carried about by fishes in the Mississippi River has thus altered an entire economic process and made pos-

sible a new industry with an output of many millions of dollars and employing many thousands of men, women, and children. Thus is justified the wisdom of Congress in providing a station for scientific research in advance of the known extent of its immediate utility.

I have spoken of rescued fishes. An important branch of the operations of the Fisheries Service is the rescue of young food fishes from the lakes and bayous of the overflowed Mississippi and Illinois Rivers and their tributaries. Operations were last year carried on at stations in Wisconsin, Iowa, Minnesota, Illinois, and Mississippi. In all, over 8,000,000 fish were thus salvaged. Over 500,000 of these were delivered to applicants and deposited in public waters, these distributions involving 34 carloads of fish. Other fishes of many kinds to the number of about 7,800,000 were rescued from landlocked waters and returned to the main rivers. Many, if not most, of these fishes would have perished from drought or from cold in winter if allowed to remain where they were found.

The sea mussel is good to eat and is found in great abundance on our coasts. Millions of bushels of these sea mussels have been growing in the bays and estuaries of our Atlantic and Pacific coasts every year, but, being ignorant of their actual value, we have been wasting a food resource, worth possibly a million dollars annually, by failing to utilize it. This is a very strange state of affairs when we realize that in Europe for centuries the sea mussel has been one of the most highly regarded shellfishes. France alone produces about four hundred million pounds annually and imports many millions more to satisfy the demand of the Parisian restaurants.

The investigators of the Bureau of Fisheries made chemical analyses of the mussel to determine the available food principles present, conducted metabolism experiments to determine the rate of digestion and the amount of nourishment absorbed by the body, and assured themselves that no poisons were present in the flesh. Then palatability experiments were made by having the bivalve served in different ways to the boarders of a large dining hall located near the Woods Hole laboratory. Persons who ate them were questioned concerning their texture, flavor, and the way they agreed with them, and the testimony was recorded. The actual cost of collecting and preparing the mussels for food was also determined.

The investigation revealed the surprising fact that the sea mussel, so long ignored by Americans, is superior to many aquatic articles which are commonly eaten. Hundreds of persons have pronounced it to be equal in flavor, or even superior, to the oyster; it is easily digested, has high nutritive value, is always in season, and is exceedingly abundant and general in its range. Especially for persons living on the coast is it an excellent cheap food. Continued experiments revealed that the sea mussel is peculiarly adapted to preservation if proper care is exercised, and when canned or pickled will retain its flavor for months.

With these facts in hand, a campaign of education was started in Boston and vicinity in 1914 for the purpose of making known the qualities of the sea mussel. We were fortunate in securing the enthusiastic support of the president of the Boston Chefs' Club, through whom practically every first-class local hotel, club, and restaurant was induced to put sea mussels on the bills of fare, and we furnished small lots of mussels free of charge, with the understanding that they were to be given a conspicuous place and patrons were to be urged to order them. At the same time a circular containing a popular account of the mussel, with approved recipes, was extensively distributed. Printed placards extolling mussels were provided for wholesale and retail merchants who would handle mussels obtained through the Bureau from beds whose sanitary condition was above suspicion. A barrel of mussels was placed in every police station in Boston for free distribution to the members of the force, and next day every policeman in the city, as he went about his beat, was advertising the qualities of sea mussels. Pushcart venders carried this cheap and wholesome food among those who did not frequent hotels, clubs, and restaurants. Lectures were delivered and mussel dinners were arranged by agents of the Bureau, a lecture sometimes preceding a dinner. In a short time the press of Boston, Lowell, Worcester, Providence, and other cities was giving the sea mussel daily attention.

The outcome of all this has been that the neglected sea mussel has become a regular and almost staple article of food in a number of eastern seaboard cities, that its reputation is extending to other cities, and that a permanent and growing mussel fishery has been established.

The fishery for sea bass, or black fish, on banks lying off the coast of North Carolina has developed well during the last fiscal

year. The largest bank has been buoyed and new ones have been discovered by the use of the steamer *Fish Hawk*.

The completion of the Grand Trunk Pacific Railway to Prince Rupert, British Columbia, provides a shorter line than has heretofore existed between the eastern and central parts of the United States and Alaska. Special efforts have been made by the Canadian authorities to attract to this route the large supplies of fresh fish, chiefly halibut, caught in Alaskan waters and consumed largely in the United States. This caused, naturally, anxiety to the fishing interests of our Northwest Pacific States, for the reason that Prince Rupert is 500 miles nearer to the Alaskan fishing lines, whence the supply has chiefly come, than is Seattle, which is the headquarters of the halibut fleet. This, of course, would involve the increased sailing of 1,000 miles if the product was to be handled from Seattle as heretofore. It became important, therefore, to determine whether a new source of supply for halibut could be found nearer to our own ports, sufficiently abundant and regular to warrant the establishment of a definite fishery.

The steamer *Albatross*, with her regular crew supplemented by some experienced halibut fishermen, began this work in 1914 and has carried it further during the summer of 1915. Meanwhile the discoveries made during the previous fiscal year have been charted and a report thereon with maps has been published. As a result, during the first two weeks of June, 1915, over 800,000 pounds of halibut were taken from these new banks, which are located close to our shores and near the ports of Oregon and Washington. New banks, furthermore, have been discovered directly off the mouth of the Columbia River where none was supposed to exist, and the survey of these was promptly taken up and was finished before this report was written. Its results will be promptly published. Certain banks have been definitely located which were only known by rumor, and fishery trials have been made thereon to show the commercial possibilities in halibut and other fisheries. It may be said that a new source of supply for halibut has already been developed and that this same source will be of greater value in the future for a supply of other fishes not now in demand.

The tilefish is said by Webster's dictionary to be extinct, but it is not. It exists over many hundreds of square miles in large quantities and is a deep-sea fish of great food value readily obtained. It is the purpose of the Fisheries Service to develop this fishery without delay.

Detailed information has been collated of the great high-sea fisheries centering at Boston and Gloucester and monthly bulletins have been issued to the trade. These records now cover many years and are invaluable for showing the condition and trend of our important offshore fisheries and the relative value of the grounds to which our vessels resort. During the calendar year 1914 such vessels brought into Boston and Gloucester 7,598 cargoes of fish, aggregating 162,589,000 pounds, valued at \$4,395,000. Compared with 1913 there was a decrease of 1,231 cargoes, an increase of 372,000 pounds, and a decrease of about \$588,000 in value.

The report on the New England otter-trawl fishery was completed and presented to Congress on January 22, 1915.

Vessels.

In lieu of the present method of appropriation for the officers and crews of the vessels of the Bureau of Fisheries, under which each position is made statutory, it has long been felt that greater efficiency will result from a lump-sum appropriation for this service.

If Congress at its next session will authorize civilian crews for the *Albatross* and *Fish Hawk*, this will be a very favorable time for the reorganization of the personnel and pay of the entire vessel service. The matter of the complement and pay for the various vessels has been carefully considered, with a view to the minimum needs and to the ratings in the vessel service of other bureaus of the Government and in the merchant marine; and it can be shown conclusively that, in addition to giving the Bureau a more elastic organization, permitting transfers as occasions warrant and the laying off of men when not needed, there will be a very substantial saving to the Government, even on the basis of full complements of crews. This saving may be shown as follows:

Pay and subsistence of Navy officers and crew on <i>Albatross</i> and <i>Fish Hawk</i> ..	\$102, 000
Present pay of regular employees on other vessels of the service	43, 160
	<hr/> 145, 160
Proposed pay of officers and crews of all vessels of the service, including substitution of civilian for Navy crews on <i>Albatross</i> and <i>Fish Hawk</i>	\$95, 000
Proposed allowance for subsistence	22, 995
	<hr/> 117, 995
Annual saving to the Government	27, 165

In view of the foregoing, the Department recommends that a lump-sum appropriation be substituted for specific appropriations

for the salaries of officers and crews of our vessels in substantially the following terms:

For the compensation of all necessary employees on vessels, including the pay of civilian crews of the *Albatross* and *Fish Hawk*, which vessels have heretofore been manned by the Navy, except scientific and clerical staff, and including commutation of rations at rates to be fixed by the Secretary of Commerce at not to exceed 50 cents per day to each person, \$117,995.

An examination made by the steamboat inspectors of the hull and machinery of the steamer *Osprey* shows that the vessel is in such bad condition as to be quite unworthy of repair. An estimate therefore has been submitted for replacing her with a more modern and economical steamer for essential work in the waters of southeastern Alaska. It is more than doubtful whether the *Osprey* can be used even in quiet waters long enough to have her successor purchased or built before she gives out entirely. Congress will therefore be asked to make the appropriation immediately available.

Marine Fishery Investigations.

The foremost position of the oyster among food products derived from the water, the readiness with which it lends itself to artificial cultivation, and the large extent of barren bottoms that may be made productive through human efforts make it preeminently fitting for the Bureau to utilize its facilities in attacking the practical problems of the industry and in determining the suitableness of bottoms now barren for oyster farming. Investigations bearing on the unsolved problems of propagation, of fattening of oysters, and of the causes of "greening," which renders such oysters unmarketable, are being prosecuted at the Woods Hole laboratory. The possibilities of a higher development of oyster culture on the Pacific coast are receiving attention, and studies are being directed to acquiring the necessary knowledge of the life history and conditions of development of both the native and the introduced eastern oysters. In continuation of its practice of cooperation with State authorities and in accordance with the authorization and direction of Congress, the Bureau has conducted a survey of Apalachicola Bay, Fla., to determine the extent of natural oyster beds and of barren bottoms suited to oyster culture. The steamer *Fish Hawk* was assigned to the survey.

The acquirement of a reasonably complete knowledge of the development of fishes from egg to adult, of their food, habits, and enemies, and of the physical conditions influencing their

movements is fundamental, without which progress in the fishery industry comparable to that made in the development of other important food industries is impossible. With this in view, trained workers at the Bureau's marine laboratories and on the auxiliary schooner *Grampus* have been engaged in studying the embryology and larval development of fishes and in collecting oceanographic data bearing on the amount and distribution of the food organisms of important food fishes and on the physical conditions affecting the food supply and influencing the movements of the fishes themselves. In addition, the systematic study of all larval and young fish obtainable is being undertaken, so that it may be possible to recognize the young of any fish at any stage without regard to its lack of similarity to the adult. These data can later be intelligently collated and used as a basis for inferences regarding the migrations and life histories of important food fishes unobtainable in any other manner.

Recent investigations having shown the possibility of gaining additional light on the age and life history of fishes from a study of the markings on the scales, the same problem is being attacked from this angle.

The auxiliary schooner *Grampus* is engaged in making a comprehensive investigation of the life history of the sea herring of the New England coast and in continuing the oceanographic study of the Gulf of Maine. The latter gives promise of producing results having an important bearing on shaping and simplifying future investigations of important food fishes of the region.

Continuing its cooperation with the Coast Guard Service, an assistant from the Bureau has been detailed for oceanographical observations upon the Coast Guard cutter *Seneca*, engaged in the ice patrol of the trans-Atlantic steamship lanes.

On the Pacific coast the canning of tuna has rapidly developed into an important industry. Unfortunately for its highest development, the tuna can not be counted upon to appear in abundance with any regularity, and the conditions which induce the appearance or disappearance of the fishes are not understood. A preliminary investigation concerning the movements of the tuna has been carried out and a number of fish marked in the hope that the possible recovery of some of these may throw light on their migrations and rate of growth. An adequate investigation can be conducted only with the aid of a seaworthy vessel capable of following their movements in the open sea.

Fresh-Water Fishery Investigations.

Fresh-water investigations, which follow in the main the methods outlined for solving marine fishery problems, are in progress, and field operations addressed to fresh waters in all parts of the country have been undertaken as usual.

The Bureau has continued its cooperation with the State Geological and Natural History Survey of Wisconsin in a thorough investigation of the fundamental biological and physical conditions of life in inclosed waters. At Madison, Wis., an extended study of the food of selected species of fishes throughout the year is being undertaken. The importance of problems of this character may be understood when it is realized that the abundance of any fish in a given body of water is limited by the minimum quantity of its food present at the time when it is required. The examination of Lake Champlain, begun in cooperation with the Vermont Fish Commission the preceding year, is nearly completed.

As Lake Cooper, formed by the great dam at Keokuk, Iowa, affords exceptional opportunities for learning from actual experience the effect of water-power development upon the general condition of fish life in the larger rivers and for studies on the migration and habits of fishes, the Bureau is endeavoring to continue systematic observations in this region. On the Pacific coast the breeding habits of the salmon of the Sacramento and Columbia Rivers are being studied in the hope of gaining knowledge of practical utility in the conservation and propagation of these fishes.

Believing, as has been already stated, that a desirable and convenient addition to the food supply of the home, together with significant collateral advantages, may be acquired by the rearing of fish in small ponds on the farm, experiments and investigations bearing directly upon the problems confronting owners of such ponds are under way. At the Fairport laboratory bass, bream, and buffalofish are at present under observation. Fry of the buffalofish from eggs artificially fertilized and hatched are being reared in artificial ponds, a hitherto unattempted venture, with encouraging results. As a pond fish, this species has the advantage of attaining a large size, of being without cannibalistic tendencies, and seemingly adapted for practical methods of artificial feeding. These experiments in the artificial propagation and rearing of this species are to be regarded as of particular impor-

tance, since it is a valuable commercial fish that is regularly diminishing in numbers.

As the correspondence of the Bureau reveals a very widespread interest in the subject of frog culture, the services of a skilled investigator have been secured to conduct a searching inquiry into the feeding habits, rate of growth, and conditions of existence of commercial species. The problem appears to be one of providing such an abundance of food that a large proportion of the young may come to maturity and a desirable rate of growth secured. The Bureau hopes that means may be discovered for propagating the important species on a commercial basis.

By the employment of temporary investigators at its laboratories, the Bureau has made special efforts to investigate the effects of pollution of various sorts, to study the form and life histories of the different kinds of parasites, and to determine the modes of transmission of infection. Congress having made provision for the employment of a fish pathologist, continuous efforts to do justice to the demands of this important field of research will be made.

The Bureau has a natural obligation and desire to give encouragement and advice in the matter of legislative measures of protection and conservation, whenever its aid is solicited. During the past year it has been represented in conferences with the authorities of the States of Florida, Georgia, and North Carolina, and has participated in a joint conference of the State officials of Wisconsin, Minnesota, Iowa, and Illinois with respect to mussel legislation.

Operations at the Fisheries Laboratories.

The facilities of the marine laboratories at Woods Hole, Mass., and Beaufort, N. C., and the fresh-water laboratory at Fairport, Iowa, have been utilized to the extent of available funds in the prosecution of problems important to the work of the Bureau of Fisheries.

At Fairport experiments to determine the feasibility of rearing certain valuable species of fresh-water mussels in crates in the open river or in ponds are meeting with an encouraging degree of success. Other experiments are devoted to determining the effect upon the mussel beds of some of the common instruments of capture, to the utilization of mussel meats, to the study of the nature and cause of pearl formation, to the relation of the fresh-water mussels to the various species of fish that serve as hosts during the

period of parasitism, and to various other lines of work of immediate concern to the propagation of fresh-water mussels and the fishery problems of the Mississippi Basin.

At Woods Hole investigations relating to various phases of oyster culture, to the utilization of waste fishes for food and other purposes, to the toxic effect of various mineral salts which may be introduced into the waters either through direct or indirect means of pollution, to the oxygen requirements and metabolism of fishes, and to studies of the life histories, habits, food, and parasitic infection of the fishes have been prosecuted.

At Beaufort, in addition to the regular investigations of the food, habits, and parasitic infection of fishes, studies of protozoa and diatoms, very low forms of animals and plants, respectively, but forms which play a very significant part in the economy of aquatic life and in various direct and indirect ways bear upon the fortunes of life of the larger animals, are being conducted. The investigations respecting the protection of wood against marine borers is still in progress.

In order to assure a greater measure of success in the propagation of diamond-back terrapin, further experiments are now in progress to determine the proper proportions of the sexes for breeding, the best conditions for hatching, and the possibilities of cross and selective breeding and the prevention of mortality. Terrapin hatched in laboratory pounds in 1909 began laying this season, thus completing the life cycle. The practice of winter feeding of the young, which practically doubles the rate of growth for the first year, and a recent change of food which further accelerates growth, may shorten the life cycle of six years of the first experimental brood.

The transfer of title for the site of the new marine biological station at Key West, Fla., is expected to be effected in the near future. An additional appropriation is needed for the construction of this station.

Alaskan Fisheries.

The season of 1914 was the most prosperous in the history of the general fisheries of Alaska. The products were valued at \$5,500,000 more than those of the previous season. The catch of salmon was the largest ever made, and was noteworthy for the enormous output of redfish in the Bristol Bay region.

In 1914 the fishing industry of Alaska gave employment to 21,200 persons, of whom slightly over 4,000 were natives. The

investment in the fisheries was approximately \$37,000,000, of which \$31,894,000 represented the salmon industry. The catch of salmon aggregated 54,650,000 fish, from which there were prepared 4,056,000 cases of canned fish valued at \$18,920,000, and miscellaneous products valued at \$638,000. The total value of the fisheries products proper in 1914 was \$21,243,000, which amount exceeded that of any other one year. The number of salmon canneries operated in Alaska in 1914 was 81, as compared with 79 in 1913 and 87 in 1912.

The annual census of red salmon ascending Wood River was omitted in 1914 but was resumed in the season of 1915. The number which ascended the river in 1915 was approximately 249,000, which number was less than that for any other year in which the census has been taken.

During the year every possible effort has been made to enforce the laws and regulations, and it is believed that as much has been done as possible with the limited personnel provided.

Section 6 of the act of Congress approved June 26, 1906, entitled "An act for the protection and regulation of the fisheries of Alaska," authorizes the limiting or prohibiting of fishing in certain Alaskan waters when in the judgment of the Secretary of Commerce such action is necessary in the interests of the fisheries, but it is required that before any such order shall be promulgated a hearing shall be held at which all persons interested may be given an opportunity to express their views. Two orders made in accordance with this statute are already effective. Recommendations having been made that the Department prohibit commercial fishing in certain other waters, arrangements were made for holding a hearing in regard to the subject at Seattle on October 1, 1915.

In the fiscal year 1914 the five privately owned salmon hatcheries in Alaska liberated 64,897,580 red-salmon fry, thereby earning for their owners tax exemptions on canned salmon amounting to \$25,959.03. In the fiscal year 1915 these hatcheries liberated 79,619,500 red-salmon fry, on which the tax exemption is \$31,847.80, the basis of exemption being 40 cents per 1,000 fry.

In order that the Department may properly discharge its functions and obligations with reference to the Alaskan fisheries, there should be a general revision of the fishing laws to meet new conditions that have arisen. There have been protracted conferences with fishing and fish-preserving interests of Alaska, looking to the drafting of a comprehensive bill that will regulate and protect

the fishes and at the same time provide a revenue from the taxation of fishing gear and the prepared products. Among other features of the existing law that require radical treatment is the practice of giving rebates of taxes in proportion to the number of salmon fry liberated from private hatcheries. Such hatcheries should be acquired by the Government at a fair valuation. The proposed measure was introduced in the House of Representatives but failed to become law. It is earnestly hoped that favorable action will be taken at the next session of Congress.

Congress will be asked to provide further facilities for enforcing the fishery laws. Two staunch motor boats are now desired. These will not meet all the requirements, but will fill a more urgent need. When these are provided, they, with the *Roosevelt* and a vessel to replace the *Osprey*, will be a reasonable beginning, and but a beginning, of the means for the supervision which over 20,000 miles of coast require, having a fishery of over \$1,000,000 annual value. One can hardly expect in these distant regions that the law shall be greatly respected when the law has not shown sufficient respect for itself to provide respectable means for its enforcement.

In my last report it was mentioned that the Deputy Commissioner of Fisheries, Dr. E. Lester Jones, was, in the spring of 1914, instructed to proceed to Alaska to make an inspection there of conditions affecting the work of the Bureau of Fisheries. His report was submitted on December 31, 1914, and presents in detail, with many illustrations from photographs taken by Dr. Jones and with maps and charts, the facts as he observed them. The report is a valuable contribution to the study of Alaskan conditions. It is available upon request of the Bureau of Fisheries. It shows in a striking way the fearful waste that accompanies what is sometimes called economy. On one page appears a photograph of the fine revenue cutter *Tahoma* lying in the harbor of Unalaska and beneath it a picture of that same vessel a few weeks later with the sea washing over her after she was wrecked on an uncharted rock off Agattu Island, with the American flag floating as an example in this case of what the Government did not do in time to protect its own valuable property.

The recommendations made in the report of Dr. Jones have been given careful consideration. Many of them were included in the fisheries bill (H. R. 21607, 63d Cong.) introduced with the Department's approval at the last session. This bill will be re-introduced into the Sixty-fourth Congress. Some of the recom-

mentations have already been adopted and carried out so far as facilities and resources warrant. The substance of others has been already treated in this report. Others are still receiving consideration.

The recommendation that at least five new Government hatcheries be built in places not at present receiving the benefit of fish-cultural operations has the cordial indorsement of this Department. It has been the subject of frequent recommendations to Congress. Even if the Government should take over the private hatcheries now in Alaska, there will still be need for these additional ones. ✓

On April 29, 1915, the Legislature of Alaska passed an act imposing additional license fees on certain kinds of business, including fisheries, salteries, fish traps, and gill nets. It at once became apparent that if the Legislature of Alaska exercises this power the result is double taxation on persons engaged in such kinds of business, and further a dual control would exist between the Department of Commerce and the Legislature of Alaska over at least a branch of such kinds of business. The latter condition is the one that primarily concerns the Department of Commerce. The control of the fisheries of Alaska is by law placed in that Department, which is responsible not only for their preservation but also for their growth and development. Clearly, if the Territory of Alaska has a joint right of control over the whole or any portion of such fisheries, the plans of the Department of Commerce for their growth and development may meet with serious interference and the result may be most harmful to the industry. If, for example, the Legislature of Alaska may impose license fees and taxes to an extent that might seriously impair the industry by making it unprofitable, the Department of Commerce, charged with the responsibility of caring for this industry, would be practically helpless.

Not even the possibility of such a situation, much less the situation itself, should be allowed to exist. As long as Congress sees fit to continue the control of the Alaska fisheries in the Department of Commerce, that control should be exclusive. It is respectfully suggested that Congress should either repeal the proviso contained in section 3 of the act of August 24, 1912, which authorizes the Legislature of Alaska to impose other and additional taxes or licenses, or so amend it as to exclude fisheries and kindred occupations in Alaska from its operation. This would leave the law as it stood before the passage of the act of August 24, 1912, and all

license fees and taxes for the carrying on of fisheries and kindred occupations in Alaska would then be fixed by Congress.

It may be urged that section 20 of the act of August 24, 1912, meets the situation. It reads thus:

All laws passed by the Legislature of the Territory of Alaska shall be submitted to the Congress by the President of the United States, and, if disapproved by Congress, they shall be null and of no effect.

This provision, however, does not meet the case, for unless by its terms Congress actually disapproves of the acts of the Alaskan Legislature they continue to have the force and effect of law. Applying it to the case under consideration, it would mean that Congress would have to disapprove each and every license tax or law that might be passed by the Legislature of Alaska on the fisheries in that Territory.

There should be no doubt on this important matter, which is respectfully commended to the attention of Congress. The difficulty appears to arise from the possible double interpretation of the provision of section 3 of the act of August 24, 1912 (37 Stat., 512), which establishes the Territory of Alaska.

The sundry civil bill making appropriations for the fiscal year 1915 provided for an increase in the number of wardens in the Alaska Service. This made it possible for the Department to extend to a limited extent its work in the way of protecting the fisheries and fur-bearing animals of Alaska.

The Fur-Seal Herd.

On page 98 of my report for 1914 it was stated that three special assistants of the Department—viz, Mr. Edward A. Preble, of the Bureau of Biological Survey, Department of Agriculture, designated by the Secretary of Agriculture; Mr. Wilfred H. Osgood, of the Field Museum of Natural History, Chicago, designated by the Secretary of the Smithsonian Institution; and Prof. George H. Parker, of Harvard University, designated by the National Academy of Sciences at the request of the President of the United States—were sent to the Pribilof Islands to make a thorough inquiry into the conditions of the fur-seal herd and various questions connected therewith.

Their report was submitted on January 23, 1915, entitled, "The Fur Seals and Other Life of the Pribilof Islands, Alaska, in 1914." This report was transmitted to the Speaker of the House of Representatives, and on February 17, 1915, was also trans-

mitted to the Committee on Printing of the United States Senate with the request that it be printed as a congressional document. This was done, and the report is Senate Document No. 980, Sixty-third Congress, third session. It also has been printed as document No. 820 of the Bureau of Fisheries, issued June 19, 1915. In this is printed in full the "note verbale" received by the Department of State from the British and Japanese Ambassadors May 29, 1914, and the instructions from the Department of Commerce to the special assistants dated May 26, 1914, together with the letter transmitting their report to the Committee on Printing of the Senate with request for its publication.

The report presents in detail, with illustrations and 24 maps and a bibliography, a full statement of the condition in 1914 of the seal herd, the fox herd, and the reindeer herd belonging to the Government on the islands, and of the facts respecting the community upon the Pribilof Islands, and other related matters.

A copy of the report was sent to each Senator and Representative of the Sixty-fourth Congress with a letter calling especial attention to it. Copies of the report were also sent to the press, to libraries, and to various persons interested in it. It is commended to the thoughtful reading of Congress and of the country.

The Alaskan seal herd was found by these special investigators in 1914 to contain approximately 294,700 animals, of which not less than 93,250 were females of breeding age.

A census of the herd taken by the officers of the Department upon the islands in July and August, 1915, showed a further increase to a total of over 360,000 animals, of which not less than 103,000 were females of breeding age.

On the recommendation of the special investigators, a maximum of 4,500 seals was fixed as the number that might be killed during the summer season of 1914 for the food purposes of the natives. The take, however, was but 2,735. This was found insufficient for a proper food supply at times during the winter of 1914-15, and since better storage facilities have meanwhile been supplied upon the islands a maximum of 5,500 has been fixed as the number which may be slaughtered during the season of 1915. At the date of this report the actual number killed is not known, but it approximates 3,500.

In February, 1915, Congress, by joint resolution, authorized the Secretary of Commerce to postpone the sale of sealskins then in his possession to such time as he might deem advisable. Under

the law as it existed theretofore, the annual sale of sealskins was required. In the unsettled state of the international fur market arising from the European war a material loss in revenue would have resulted had the sale been forced during the past fiscal year.

There are now in cold storage 3,296 sealskins, to which should be added the number taken from animals slaughtered during the summer season of 1915. If war conditions continue so as to close international markets, it may be necessary to request from Congress authority to postpone the sale of the skins taken this season as was done last year. The Department has under consideration, however, a plan whereby all of these raw skins, those taken both in 1914 and in 1915, may be dressed and dyed in this country by the best process known anywhere for the purpose and not hitherto used in this country, which would result not only in saving the skins from any possible deterioration in storage but would permit their sale as fully dressed and dyed furs of the best quality at prices remunerative to the Government. This would save the purchasers the cost of shipment to Great Britain for dyeing and dressing, as has heretofore been necessary, the expense of reshipment to this country, and the duty heretofore imposed upon them when so reshipped.

The result of this arrangement would be to put into American control the entire process from beginning to end, to bring to this country an industry not existing here before and to save upon this valuable product a large amount of unnecessary expense which has hitherto been imposed thereon by reason of our dependence upon a foreign source for dyeing and dressing.

When commercial killing of fur seals shall be renewed—and the rapid growth of the herd will make that soon both possible and desirable—other products of that herd than the fur skins should have a consideration which has never been given them. The seal carcasses contain materials of economic value which have hitherto been wasted and which are far beyond the power of the native community to utilize. The Department is giving the profitable utilization of seal meat and refuse careful thought. Valuable suggestions have already been made upon this subject by Mr. G. Dallas Hanna and others upon the islands. It is possible that not only may food products be made available but that in other ways the animals will be found to have economic value. To save only skins and waste the rest of the animal is no longer in accord either with scientific knowledge or good industrial practice.

The Seal-Island Natives.

Reports from the seal islands show a material improvement in the physical, moral, educational, and industrial relations of the natives. Steps have been taken to carry out, as far as practicable, the various recommendations and suggestions of the special investigators with reference to the natives, and still further improvement may confidently be expected as a result of support from Congress.

The use of intoxicating liquors by these natives has always been one of their chief handicaps, and the Government has been singularly derelict in protecting them in this respect from themselves and from outsiders. For years they have been permitted to brew in their houses an intoxicating drink made from the supplies furnished by the Government, and on special occasions they had been regularly served with liquors by Government agents, although this was strictly in violation of regulations. On March 1, 1915, the Department issued a circular order embodying full regulations covering the delivery and use of intoxicating liquors on the Pribilofs, and positively prohibiting, under all circumstances, the giving of such liquors to the natives except as medicine and in religious ceremonies, and suppressing the manufacture of intoxicants by the natives.

An important innovation in the relations of the Government to the natives has been in the method of compensating them for services rendered. Formerly it was the practice to pay cash for such services, and a comparatively large proportion of the appropriation was thus expended. The cash thus acquired by the natives was largely used by them in purchasing supplies at the Government stores, and the sums received from such sales were, under the law, covered into the United States Treasury. There was thus a double drain on an appropriation none too large for the legitimate purposes in hand. Now all able-bodied natives are required to perform some labor, and they are paid therefor in supplies. This arrangement has not been brought about without some difficulty with the natives, but in general appears to be working well. The agent on St. George Island reports that the natives "have both privately and as a body expressed their preference for the present method of issuing all necessary supplies as against receiving pay in cash for all labor and buying with their earnings their food and all other necessary articles."

On the resumption of commercial seal killing, when, under law, the natives are entitled to compensation for service

formed in various capacities, arrangements should be made by which the expense thus incurred shall be deducted from the selling price of the sealskins and not from the appropriation for the maintenance of the fur-seal service.

Supplies for the Pribilof Islands.

A more economical method of procedure in obtaining supplies for the Pribilof Islands was instituted in 1914-15. In the past the comparatively large quantities of general supplies for natives and Government employees have been bought either without competition or on more or less informal proposals. During the past year comprehensive schedules were printed and distributed to prospective bidders in Seattle, San Francisco, St. Louis, Chicago, New York, Boston, and other cities, and a material saving resulted from the strictly competitive proposals which were received.

A shortage of certain supplies on the islands having developed in the winter of 1914-15, a small shipment was made on a chartered fishing vessel. Whenever practicable a vessel should be sent to the islands each winter, not only for the purpose of carrying supplies but for taking mails and for its general effect on the morale of the natives. When the Department has its own vessel for this service, the almost prohibitive cost of transportation to the seal islands that has heretofore been encountered will be overcome, and the unfortunate results which have arisen in large part from the isolation of the native community and the officers controlling them during six months of the year will pass away. For this purpose and for the general service of the fisheries upon the Alaskan coast the Department bought for the Bureau of Fisheries on February 25, 1915, the well-known North Polar steamer *Roosevelt*. She has been improved by providing equipment for burning fuel oil under her boilers.

Upon careful inspection made by officers of the Steamboat-Inspection Service and of the Lighthouse Service, and after a trial trip, the vessel seemed to be in good condition for the voyage through the Panama Canal to her post of duty. After leaving New York, however, en route to Norfolk, there to take a cargo of coal to the islands, unforeseen difficulties arose in her boilers and engines which required that same be overhauled, and that work is now progressing at the Norfolk Navy Yard.

The *Roosevelt* will be of untold value in Alaskan waters. She is peculiarly fitted for coping with winter conditions on those seas.

Her use will save the cost of chartering vessels to carry supplies back and forth to the islands, a matter which has alone been an expense of \$20,000 or more a year. She will bring back the fur-seal and fox skins and other products from the islands. She will afford a means of communication throughout the year to that isolated community, and apart from this will relieve the entire Fisheries Service from the humiliating necessity of borrowing vessels to make inspections from the persons to be inspected, and will for the first time provide for the extensive fisheries of Alaska the supervision which the law contemplates but which has never heretofore existed. Able to navigate the rough waters of Alaska at any season, she will be a safeguard to the Government interests and her use will prove of great public and private value.

Fur-Bearing Land Animals.

The Department should be relieved of custody over the fur-bearing animals whose pursuit does not constitute a fishery.

Very careful study was given to the subject by an interdepartmental committee of the Departments of Commerce and Agriculture composed of Dr. E. Lester Jones, then Deputy Commissioner of Fisheries, Mr. Ward T. Bower, agent in charge of Alaska Service of Bureau of Fisheries, both representing the Department of Commerce, Mr. E. W. Nelson, Assistant Chief of Biological Survey, and Dr. T. S. Palmer, Assistant in Charge Game Preservation, Biological Survey, representing the Department of Agriculture. This committee on April 10, 1915, presented a comprehensive report recommending—

(1) That Congress be requested to provide by appropriate legislation for the transfer to the Department of Agriculture of jurisdiction over terrestrial fur-bearing animals in Alaska.

(2) Such legislation should provide that the Department of Commerce exercise exclusive jurisdiction over fisheries, fur seals, sea otters, walrus, sea lions, whales, porpoises, and other aquatic mammals of that Territory, and for this purpose should retain its present personnel.

(3) That pending legislation by Congress no change should be made in the Executive order for the Aleutian Islands Reservation, but that the departments should continue to cooperate as heretofore in administering the various interests on this reservation.

The two departments will support legislation having for its purpose the carrying out of their recommendations. Certain very absurd conditions have arisen out of the present state of the law.

For example, the black bear, being called a fur-bearing animal, is under the jurisdiction of the Department of Commerce. The brown bear, though he has fur on him, being called technically a game animal, is under the jurisdiction of the Department of Agriculture. If now black bears have brown cubs, under whose jurisdiction is the brown cub of the black bear? This case has actually arisen.

I respectfully urge the passage of legislation in accord with the interdepartmental committee's report to put an end to this.

In the winter of 1913-14 the Government herds of blue foxes on the seal islands yielded 256 pelts and the white foxes 25. In the winter of 1914-15 the number of blue-fox pelts was 253 and of white-fox pelts 40. These will be sold in the fall of 1915 at public auction.

The Department of Commerce acknowledges with gratitude the continued able assistance of the cutters belonging to the Coast Guard. Their patrol in the season when pelagic sealing operations are possible has been of great value, and they have rendered valuable service also in transferring officers and mails to and from the Pribilof Islands and in transporting small quantities of supplies.

The wireless telegraph stations maintained by the Navy Department on St. Paul and St. George Islands have been constantly used and are of great value. The Fisheries Service now requires weekly reports of conditions upon the islands by means of the wireless service.

After conference with the Department of Agriculture, new regulations for the Alaskan Islands Reservation were adopted by the Department of Commerce governing fishing and the taking of fur-bearing animals.

The recent expansion in the business of fur farming has developed a number of conditions which under existing law the Department is unable to regulate properly. When the present law was enacted, practically the only reason for capturing wild fur-bearing animals was to secure their pelts, and the authority to regulate the capturing of live animals and the shipping of them from the Territory was not granted to the Department. Undoubtedly there is a great deal of waste of young fox life due to the indiscriminate digging of young animals from their nests by irresponsible persons for use on fur farms. Apparently the only regulations for which the Department could secure enforcement are those which concern the killing of fur-bearing animals. Bills

for the purpose of providing remedies for the present unsatisfactory condition will be introduced in Congress, and it is hoped the additional legislation may soon be had.

In May, 1915, the Department revised the existing regulations. They became effective June 1, 1915, and were published as Department Circular No. 246, third edition.

The Department has continued the regulation that all shipments of furs from Alaska shall be reported to the Commissioner of Fisheries. All reports of shipments by mail are certified by the postmasters at the shipping points. Express and commercial companies have shown a commendable spirit of cooperation in the matter of shipments made through their offices. Compilations of these shipments are made annually for a period extending from November 16 of one year to November 15 of the following year, the idea in compiling the statistics for those periods being to make the results correspond as nearly as possible with the actual take of pelts in each open season. On the whole the statistics indicate that the quantities of furs shipped from Alaska are being maintained fairly well. A few comparisons for the year ended November 15, 1914, with the year ended November 15, 1913, are made: Ermine, 6,873 in 1914, 6,559 in 1913; red fox, 14,967 in 1914, 10,820 in 1913; white fox, 6,530 in 1914, 3,756 in 1913; lynx, 6,930 in 1914, 4,772 in 1913; marten, 6,497 in 1914, 9,682 in 1913; mink, 35,623 in 1914, 47,062 in 1913; muskrat, 101,202 in 1914, 163,616 in 1913; land otter, 1,008 in 1914, 1,300 in 1913. It must be recalled that the fall of 1914 witnessed an unusual depression in the fur trade, which may have caused a decrease in the number of shipments which would otherwise have been made.

I venture to suggest that it is desirable a joint committee of Congress should visit the Pribilof Islands in the summer of 1916. The Government property there in the seal herd, the fox herd, and the reindeer herd is of great and increasing value. The suggestion has been made to the Department by well-informed parties that Dutch Harbor should be purchased for Government uses. The condition of the housing of the native community is a matter of serious importance, and so is the provision of the necessary storage and semipublic buildings which in that climate are urgently required and which should be put upon a much more satisfactory basis than they ever have been. The problems presented by the management of this Government property are not only of national but of international importance. There has been far too much bitterness and attack in debating them,

far too much of the spirit of mutual recrimination. The subject is one which should be treated in calm judicial spirit in accordance with the facts and without regard to prejudice. The problems are those of the present and of the future. With these, and with these alone, this Department is concerned. I do not consider that the past is within its scope. It seems to me, however, of urgent importance that Congress should see for itself by the eyes of its own members just what the conditions are. To that end the Department of Commerce will willingly contribute in any way within its power.

The work of the Bureau of Fisheries involves the direct application of scientific research to human life. It takes the results of biology and uses them to sustain the pearl-button industry. It searches into the feeding habits of fish and as a result publishes information concerning those which are active consumers of mosquitoes. It furnishes for the home practical cookbooks telling how to use the salmon, the tilefish, the oyster, and the sea mussel. It is studying the life history of the hard clam, or quahog, to determine whether it can be cultivated in Chesapeake Bay and elsewhere. It strives to utilize unused, unknown, or wasted articles of food or those having economic value. It will ask Congress in the coming session for a fund for instructing those who depend upon the fisheries how best to conserve the supply upon which their own living depends. In this effort it will have the support of the fish commissioners of all the coastwise States.

BUREAU OF LIGHTHOUSES.

Five years having passed since the Lighthouse Service was reorganized under the law which took effect July 1, 1910, a brief review of the progress of the lighthouse work in the United States during that period is given.

Progress Under New Organization.

There were on June 30, 1910, 11,713 aids to navigation. On June 30, 1915, there were 14,544. This is a net increase of 2,831, or 24 per cent, and is an average annual increase of 566 aids. This, it will be seen, is an average increase of about three new aids every two days in the year or almost two new aids daily every working day. These aids include lighthouses of all sizes, light vessels, lighted buoys, post lights, unlighted buoys of all kinds, submarine bells, fog signals, and daymarks.

Careful attention has been given to improving apparatus and equipment to accord with the best modern practice of coast lighting. In this process gas buoys, which are more valued by mariners than any other recent addition to coast lighting, have been increased from 225 in 1910 to 479 in 1915, an addition of 254. Oil-vapor lamps have been greatly appreciated because of their superior brilliancy. The number of such installations at light stations has increased from 80 in 1910 to 286 in 1915. This is a gain of 206 stations, or over 250 per cent. Most of the primary coast lights are now provided with oil-vapor lamps.

Steady progress has been made in changing fixed lights and flashing or occulting lights in cases where doubt might occur, and 169 lights have been so improved in the five-year period.

There has been a strong demand arising from urgent need for improved lighting of the Alaskan waters, and the number of lights on the coast of Alaska has been increased from 37 in 1910 to 112 in 1915, a gain of 75, or over 200 per cent. The total number of fog signals, including sounding buoys, has grown from 844 in 1910 to 1,044 in 1915.

During the five years since 1910 the organization and business methods of the Service have been thoroughly examined and revised wherever it appeared desirable to do so. In securing in-

creased effectiveness and economy the welfare of the personnel has been constantly considered.

The general organization of the Lighthouse Service remains the same as described on page 109 of my report for 1913, and is given in full on page 6 of the report of the Commissioner of Lighthouses for the fiscal year 1915. There were on June 30, 1915, 5,792 authorized positions in the Lighthouse Service. Of these, 123 were in the technical force, 145 in the clerical and office force, and 5,524 connected with depots, lighthouses, and vessels.

Aids to Navigation.

During the fiscal year ended June 30, 1915, there was a net increase of 359 in the total number of aids to navigation maintained by the Lighthouse Service, including 74 lights above the order of minor lights, 1 light vessel, 8 fog signals, 2 submarine bells, 26 daymarks, 25 lighted buoys, 170 unlighted buoys, and 53 minor lights.

Fixed lights were changed to flashing or occulting at 29 stations. The illuminant of 21 lights was changed to incandescent oil vapor, the illuminant of 23 lights was changed to acetylene, and the illuminant of 2 lights was changed to oil gas. Two new light vessels were established during the year. On June 30, 1915, there were maintained by the Lighthouse Service 14,544 aids to navigation, including 5,155 lights of all classes, and 577 fog signals, of which 50 are submarine signals. The systematic methods of improvement and the use of modern apparatus in increasing the number and brilliancy of aids have been of value to the safety of commerce.

The following are some of the more important aids which have been established or materially improved during the past fiscal year:

New light vessels, with flashing lights and compressed-air fog signals, were established at Poe Reef, Straits of Mackinac, Lake Huron, Mich., and at Buffalo Entrance, Lake Erie, N. Y. Both of these were former light-vessel stations, which had been temporarily discontinued, one having been discontinued during the fiscal year.

New light and fog-signal stations have been constructed at Brandywine Shoal, Del., and Thimble Shoal, Va., to replace former structures.

A complete new system of lighted aids was established at the approaches to the Cape Cod Canal, Mass.

Important coast lights changed from fixed to flashing or occulting: Cape Sarichef, Unimak Pass, Alaska; Ediz Hook, Juan de Fuca Strait, Wash.; Diamond Head, Oahu, Hawaii; Fowey Rocks and Sombrero Key, Florida Reefs, Fla.

Fog signals established: Gallups Island, Boston Harbor, Mass. (electric bell); Fort McHenry, Baltimore Harbor, Md. (electric bell); Volusia Bar, St. Johns River, Fla. (bell); Point Blunt and Point Stuart, Angel Island, San Francisco Bay, Cal. (electric sirens). The former third-class reed horn at Stratford Shoal (Middle Ground), Long Island Sound, N. Y., was changed to a first-class automatic siren.

Submarine bells established: South Pass gas and whistling buoy, Mississippi Passes, La.; Frying Pan Shoals gas and whistling buoy, N. C.; Martins Reef Light Vessel, Lake Huron, Mich.

Important gas buoys established: Buzzards Bay, Mass. (2); Cape Cod Canal approach, Mass. (bell); Cornfield Point, Long Island Sound, Conn. (whistle); Cape Henry, Va. (whistle); Wimble Shoal, north of Cape Hatteras, N. C. (whistle); Fernandina Entrance, Fla.; Smith Shoal, Glama Wreck, and New Ground Rocks, Florida Reefs, Fla. (each with whistle); Point Arenas, Vieques Passage, P. R.; Hein Bank, Juan de Fuca Strait, Wash. (bell); South Channel Columbia River Entrance, Oreg. (whistle).

Systems of minor aids and buoyage extensively rearranged or improved in important localities: Hudson River, N. Y.; inland waterway, N. J.; Chincoteague Bay, Va.; Newport News Channel, Va.; inland waterway, Fernandina to St. Johns River, Fla.; Santa Rosa Sound, Fla.; Black Rock Channel, Buffalo Harbor, N. Y.; Klag Bay, Alaska; Grays Harbor, Wash.; Yaquina Bay, Oreg.

Flashing acetylene gas lights established: Stockton Harbor Range, Me. (2 lights); Buzzards Bay, Mass. (12 lights); Egmont Key Range Front, Fla.; North Bank, Cedar Keys, Fla.; Ashtabula Harbor, Ohio (2 lights); Conneaut Breakwater, Ohio; Livingstone Channel, Detroit River, Mich.; Manistique Harbor, Mich.; Saugatuck Harbor, Mich.; Oconto Harbor, Wis.; Rugged Island, Resurrection Bay, Alaska.

The amount of hurricane and ice damage during the fiscal year was relatively small, but a number of unusually heavy winter and spring gales, particularly on the Atlantic coast, damaged various vessels and stations. Among these may be mentioned the Atlantic gales of December 5 and 6, 1914, January 12 to 14, and April 2

to 4, 1915; also the Pacific gale of April 29 and 30, 1915, the total aggregate damage amounting to approximately \$50,000.

The systematic relief of all buoys at least once a year was carried out throughout the Service with a greater degree of completeness than in prior years, particularly in those districts where difficulties had been previously experienced on account of the large number of inaccessible buoys.

A systematic plan was developed for keeping records of extinguishment of various types of automatic gas lights, both on fixed and floating aids, with arrangements for reporting the percentage of nights extinguished as compared to the entire period under observation. This will be useful in compiling information as to the comparative efficiency of various types in service and the degree of reliance which may be placed on such lights.

Further improvements in publishing notices to mariners were undertaken during the year by adopting a more concise form, giving only such facts as are of principal interest to the mariner.

The light lists for the Atlantic, Lake, and Pacific coasts were each issued in octavo form, which is believed will increase their usefulness to mariners. Special effort was made to publish the seacoast light lists as soon after the first of the calendar year as possible, and the Lake list was issued immediately prior to the opening of the season of navigation.

Aids to navigation at Guantanamo Bay, Cuba, at the American Samoan Islands, and the island of Guam are maintained under the supervision of the naval commandants at these places through allotments made from the appropriations for the Lighthouse Service. The approximate annual expense for the maintenance of aids at all three is a total of \$6,500.

The United States assists in maintaining one lighthouse outside of its territory, this being at Cape Spartel, Morocco. The sum of \$325 per annum is carried in an appropriation for the Department of State for this purpose. The lighthouse was constructed at the expense of Morocco, but is operated by a committee of consuls of the United States, Austria, Belgium, Spain, France, Great Britain, Italy, Netherlands, Portugal, and Sweden under a convention which has been in force since March 12, 1867.

Alaska.

The total number of aids to navigation in Alaska, including lights, fog signals, buoys, and daymarks, in commission at the close of the fiscal year ended June 30, 1915, was 338, including

112 lights. The following table, which gives the total number of aids to navigation on June 30 of each year named, illustrates the progress in establishing aids in the Territory:

Aids.	1910	1911	1912	1913	1914	1915
Lights.....	37	71	85	93	108	112
Fog signals.....	9	10	10	10	10	10
Buoys.....	84	105	132	136	157	167
Daymarks.....	30	29	38	40	44	49
Total.....	160	215	265	279	319	338

The act of October 22, 1913, made an appropriation of \$115,000 for a light and fog-signal station at or near Cape St. Elias, and an item for the establishment of aids to navigation and improvement of existing aids in Alaska in the sum of \$60,000 was included in the sundry civil act approved August 1, 1914. Work on both of these objects was started as promptly as conditions would permit, and satisfactory progress on each had been made up to the date of this report.

The act of January 25, 1915, appropriated \$250,000 for the new lighthouse tender *Cedar*, urgently needed for the work of the Service in Alaska. In order to take advantage of market conditions, plans and specifications were prepared in the shortest practicable time. Copy of the specifications was sent to the printer March 1, 1915, proposals were issued March 11, bids were opened April 27, and the contract was awarded May 4, 1915, to the Craig Shipbuilding Co., Long Beach, Cal., in the sum of \$234,500.

The *Cedar* will be the largest vessel in the Service and is especially designed for working in the rough seas off the coast of Alaska. She is designed to carry four light quick-firing guns in case her services should be needed for patrol work. Pending her construction the tender *Kukui*, an able seagoing vessel, was transferred from the Hawaiian Islands to Alaska in order to care for the necessary work on the Alaskan coast.

The new tender *Fern*, for service in the inside waters of southeastern Alaska, was completed during the fiscal year and immediately assigned to duty.

Administrative Methods and Economies.

A second conference of lighthouse inspectors, authorized by me, was held during February, 1915. The program followed the same general lines as last year, and the results are believed beneficial to the Service.

A new edition of the Regulations for the Lighthouse Service was approved by the Department and issued to take effect October 1, 1914. Revised rules providing for progress payments for 75 per cent of work done, under suitable restrictions and safeguards, were put in effect.

The practice of systematic inspections of the various lighthouse districts by the general inspector, examiner, and officers of the Bureau was continued with good results.

The standard method of cost keeping was continued during the fiscal year.

Instructions were issued the inspectors in reference to the exchange of blue prints of new devices, methods, etc., among the various district offices, in order that all offices may be kept promptly informed of any desirable improvements or apparatus.

Instructions in reference to the more general use of mileage books for employees when traveling on official business were issued for guidance whenever economy might be thereby secured.

In order to facilitate assignment of employees from one lighthouse tender to another, as the interests of the Service require, the Department authorized the regarding of all appointive positions on tenders as in the Lighthouse Service at large, instead of on the particular vessel, as was formerly the case. This will greatly lessen the number of papers required to be prepared when vessels are transferred from one district to another.

With a view to preliminary training for light keepers prior to their permanent assignment to light stations, arrangements have been made for the appointment of a few additional keepers for a trial system of general training and instruction for such employees in selected districts.

The custom of issuing lists of spare property available for transfer in all lighthouse districts was continued with good results.

The publication of the monthly Lighthouse Service Bulletin was continued throughout the year, with beneficial results.

The exhibit of the Lighthouse Service at the Panama-Pacific International Exposition at San Francisco was installed. This included the lens and lantern for the lighthouse being erected at Cape St. Elias, Alaska.

Engineering and Construction.

New works of principal importance under special appropriations completed during the fiscal year are as follows: Cape Cod Canal entrance lights, New Bedford (North Dike) N. Y.,

light and fog signal; Miah Maull Shoal, N. J., light and fog signal; Brandywine Shoal, Del., light and fog signal; Thimble Shoal, Va., light and fog signal; Cape Fear River lights, below Wilmington, N. C.; Oconto Harbor light, Wis.; and Point Arena, Cal., improvement of road.

Other important work in progress at the close of the fiscal year includes Atchafalaya Entrance Channel, La., aids to navigation; Galveston Jetty, Tex., light station; Navassa Island, West Indies, light station; Ashtabula, Lorain, and Cleveland, Ohio, light stations; Ashland, Wis., light and fog signal; Manistique, Mich., light and fog signal; and Cape St. Elias, Alaska, light and fog signal.

Extensive study has been given to the protection of exposed shores of various lighthouse reservations from erosion by the sea, and good results have been obtained in a number of instances by the judicious location of bulkheads, sea walls, or groynes.

A study was also made of the effects of sea water on concrete piles in lighthouse works in the South Atlantic and Gulf coasts.

A new type of single-pile pipe beacon, carrying a latticed cage daymark, was developed and several placed in service at a moderate cost.

Careful attention has been given in the matter of designing, to develop permanent and fireproof structures in all cases where available funds will permit.

Improvement of Apparatus and Equipment.

Service tests have been made of spar buoys made from logs cut on lighthouse reservations on the Great Lakes. The quality of the timber is good, and a considerable saving in cost has also been effected.

Improvements have been made in connection with electric sirens, to avoid the rising and falling notes and the wearing of the bearings due to continued starting and stopping of the mechanism.

Experimental installations were made of temporary unwatched gas lights for winter use at certain isolated stations on the Great Lakes, permitting the keepers to leave under safer conditions and at the same time giving service to belated mariners after the close of the regular navigation season. Three such installations were in commission on Lake Michigan last winter and gave good results. Consideration will be given to extending this arrangement to other important offshore Lake stations.

A new type of electric flasher for gas lights was developed and placed in service. This device is operated by means of dry cells, which control magnets opening and closing the gas valve, as contacts are made by detachable cams on a master clock. Any desired characteristic may be obtained by the attachment of properly arranged cams.

In order to facilitate the landing of supplies and mail at certain isolated Alaska stations, line-throwing guns, similar to those in use by the Coast Guard, have been installed as part of the station equipment. Experiments are also in progress to determine the best gun of the kind for use on board lighthouse tenders for passing lines to other vessels in heavy weather. It is intended to equip all the larger tenders with such guns as rapidly as possible.

A fog-signal installation, with sirens 900 feet distant from the compressors, has been in successful operation. The blasts are given by pneumatic valves controlled by solenoids, which in turn are energized by a battery and the time intervals regulated by a timing device in the power house. The entire installation is in duplicate, and so arranged that either siren may be operated at will by means of switches at the power house.

A two-tank cast-iron breakwater light has been designed, with the object of supporting the lantern and tanks at such heights that waves breaking over the breakwater will have relatively slight effect upon the structure.

Service tests have been made of new brands of red paint, particularly in localities where the action of the elements has been found severe owing to unfavorable conditions of heat and moisture. These tests have been successful, and such paints, although higher in cost, give the aids so painted a very conspicuous and bright appearance.

Appropriations.

In addition to the maintenance appropriations for the current fiscal year, appropriations for the following special works were made by Congress during the fiscal year 1915:

Carpenter shop for the General Lighthouse Depot, Tompkinsville, N. Y. . . .	\$23, 000
Completion of Kilauea Point light station, Kauai Island, Hawaii.	3, 000
Aids to navigation in Alaska.	60, 000
Aids to navigation at the entrances to the Cape Cod Canal, Mass.	50, 000
Lighthouse tender for general service.	250, 000

In submitting estimates for the maintenance of the Service for the fiscal year 1917 reasonable consideration has been given to

the growth of the Service, and particularly to the fact that an increase is essential in the appropriation for salaries of vessels in order to keep in commission the present vessels of the Service and to man those under construction when completed, and also to the inadequacy of the salaries at present paid to the lighthouse inspectors.

Besides the estimates for maintenance, estimates for 36 special works have been submitted, aggregating \$2,002,300. These include—

- 2 new lighthouse tenders.
- 2 new light vessels.
- 9 new light and fog-signal stations.
- 3 new light stations.
- 2 new lighthouse depots.
- 6 items for establishing or improving aids in general localities.
- 1 item for a new system of harbor or channel lights and other aids.
- 6 items for improvement of light or fog-signal stations or of groups of aids to navigation.
- 4 items for improvement of lighthouse depots.
- 1 item for light-keepers' dwellings.

Special attention is invited to the fact that the appropriations for special works in the Lighthouse Service for the two fiscal years 1915 and 1916 total only \$386,000, whereas the average amount for the 10 preceding fiscal years was \$946,927 annually. A large part of the items submitted are the same as those submitted last year, for which appropriation has not yet been made, although a part of them have been authorized by Congress. These items are all considered meritorious and urgent for the safety of shipping and have often been requested by navigators and maritime interests.

Vessels.

Forty-six lighthouse tenders have been in commission during the fiscal year. These have steamed a total of approximately 469,000 nautical miles during the fiscal year in their work of supplying light stations, maintaining the buoyage system, transporting construction materials, and carrying the officers and employees of the Service to their stations or on inspection duty.

The following number of tenders were in service on June 30 of the years specified, omitting vessels not having regular crews and those less than 50 feet in length: 1910, 51; 1911, 46; 1912, 45; 1913, 44; 1914, 45; 1915, 46. On June 30, 1915, 40 tenders were in actual service, 1 was laid up, and 5 were undergoing repairs.

The following table shows the cost in detail of maintaining the large and medium size tenders, 37 vessels in all, including every

item for which direct outlay has been made, showing the miles steamed and the cost per mile. It should be noted in connection with this table that the vessels are operated under dissimilar conditions. Coal costs more in Hawaii than at Norfolk, and the same is true of other matters. The table does not show interest charges or depreciation (except so far as this last may be covered by repairs and improvements, which are included), nor is there any charge for insurance. It includes vessels which operate on the Atlantic and Pacific Oceans and the Gulf and their adjacent waters. The limits of the respective districts whose numbers are given will be found on pages 28 to 30 of the report of the Commissioner of Lighthouses.

The vessels classed as large tenders, except the *Sunflower*, are 190 feet over all, 30 feet beam, and have a maximum draft of about 13 feet, with a corresponding displacement tonnage of 1,053. The *Sunflower* is 174 feet over all, 31 feet beam, and has a maximum draft of about 12 feet, with corresponding displacement tonnage of 986.

The vessels classed as medium tenders vary in length over all from 179 to 105 feet, in beam from 30 to 20 feet, in maximum draft from 12 to 6½ feet, and in maximum displacement tonnage from 975 to 233.

COST OF MAINTAINING TENDERS IN THE LIGHTHOUSE SERVICE, FISCAL YEAR 1915.

Dis- trict.	Name of tender.	Pay officers and crew.	Subsist- ence.	Fuel.	Sup- plies.	Other ex- penses.	Total mainte- nance.	Repairs and improvements.					Total cost of tender.	Miles steamed.	Cost per mile.	
								Hull, etc.	Bollers, etc.	Moor- ings.	Boats.	Total.			Mainte- nance.	Total.
LARGE TENDERS.																
1	Hibiscus.....	\$17,714	\$5,404	\$9,000	\$2,553	\$610	\$35,301	\$649	\$1,173	83	843	\$1,868	13,366	\$2.64	\$2.78	
2	Anemone.....	18,813	6,133	8,998	3,349	142	37,435	858	1,972	.....	20	2,149	39,584	2.65	2.86
3	Tulip.....	19,823	6,135	6,945	3,587	36	36,596	2,784	1,096	77	62	4,020	40,546	2.22	2.46	
5	Orchid.....	18,384	5,743	5,161	2,639	46	31,973	4,138	3,543	288	148	8,117	40,090	2.22	2.79	
6	Cypress.....	18,594	6,026	9,787	3,781	50	38,238	2,803	1,181	37	48	4,069	42,307	1.89	2.09	
8	Sunflower.....	18,605	5,901	8,240	2,467	396	35,609	1,048	1,140	.....	39	2,227	37,836	2.76	2.93
16	Kukul.....	22,930	6,166	10,624	6,432	159	46,331	6,234	4,948	.....	533	11,705	58,036	6.14	7.69
17	Manzanita.....	22,297	5,796	8,454	2,866	6	39,419	1,106	745	.....	90	1,941	41,360	3.01	3.11
18	Sequoda.....	22,590	5,874	10,095	2,866	693	42,118	1,125	1,487	117	.....	2,729	44,847	3.92	4.17
Total (9).....		279,770	53,178	77,324	30,540	2,138	342,950	20,745	16,584	522	973	38,825	381,775	2.79	3.11	
Average.....		19,974	5,909	8,592	3,393	238	38,106	2,305	1,843	58	108	4,314	42,419	.....	.....
MEDIUM TENDERS.																
1	Zizania.....	14,750	4,785	7,072	2,524	720	29,851	1,000	2,472	37	512	4,021	33,872	3.23	3.67	
2	Lilac.....	16,076	5,194	5,868	2,182	508	29,828	1,185	1,024	.....	96	2,305	32,133	2.43	2.62
2	Azalea.....	14,954	4,845	3,829	2,857	234	26,717	909	400	18	160	1,487	28,204	2.32	2.45	
3	Mayflower.....	16,516	5,067	5,903	2,333	301	29,919	7,088	2,161	.....	76	9,325	39,244	3.16	4.14
	Gardenia.....	9,120	3,163	1,398	2,263	5	15,948	676	314	.....	13	1,003	16,957	1.83	1.94
	John Rodgers.....	11,908	3,978	3,295	1,699	49	20,859	987	244	.....	438	1,669	22,528	2.87	3.10
	Larkspur.....	16,704	5,382	6,277	2,303	4	30,660	509	573	.....	4	1,086	32,046	2.26	2.34
	Mistletoe.....	11,164	3,737	2,351	1,558	58	18,868	1,278	729	13	126	1,945	20,413	2.45	2.65	
	Punay.....	10,209	3,060	160	1,164	2	14,685	4,775	6,012	.....	.....	10,787	25,472	.....	.....
4	Iris.....	14,155	4,218	4,208	3,322	299	26,202	959	2,201	.....	.....	3,093	29,295	2.21	2.47
5	Holly.....	12,006	3,941	2,771	1,943	5	20,667	463	362	208	41	1,075	21,742	2.08	2.28	

b Includes 14 days in eighth district.

c Includes repairs made in third district.

COST OF MAINTAINING TENDERS IN THE LIGHTHOUSE SERVICE, FISCAL YEAR 1915—Continued.

District.	Name of tender.	Pay officers and crew.	Subsistence.	Fuel.	Supplies.	Other ex- penses.	Total main- tenance.	Repairs and improvements.				Total cost of tender.	Miles steamed.	Cost per mile.	
								Hull, etc.	Boilers, etc.	Moor- ings.	Boats.			Total.	Mainte- nance.	Total.
MEDIUM TENDERS—contd.															
	Ivy.....	\$16,162	\$5,126	a \$5,325	\$3,622	\$178	\$30,414	\$3,101	\$2,230	\$116	\$1,093	\$6,540	10,419	\$2.92	\$3.35
	Jessamine.....	11,920	3,895	2,483	1,854	60	20,190	2,710	350	42	261	3,363	8,062	2.50	2.92
	Laurel b.....	1,235	378	39	1,102	9	2,762	8	.....	12	95	115	385	7.17	7.47
	Maple.....	17,411	5,478	4,057	2,542	137	30,615	2,239	470	114	283	3,106	13,397	2.21	2.44
6	Mangrove.....	17,341	5,736	6,636	3,247	28	32,988	2,555	2,176	.....	22	4,713	14,170	2.33	2.66
7	Arbutus.....	15,479	4,918	6,248	2,628	454	29,727	2,765	89	.....	4	c 2,858	9,590	3.11	3.41
8	Magnolia.....	15,075	4,821	6,037	2,799	499	29,141	1,868	2,996	.....	67	4,961	10,872	2.68	3.14
	Camellia.....	10,593	3,352	2,789	1,404	326	18,464	489	749	.....	33	1,271	4,999	3.69	3.95
9	Myrtle.....	13,666	4,228	4,619	1,682	753	24,948	226	.....	.....	16	242	8,177	3.05	3.38
10	Crocus.....	16,523	5,153	4,387	3,351	1,221	30,635	4,323	1,617	.....	122	6,082	7,884	3.88	4.66
11	Amaranth.....	14,825	4,621	6,590	4,254	249	30,539	3,646	285	.....	75	4,006	10,341	2.95	3.34
	Aspen.....	9,061	2,828	1,555	1,459	335	16,228	2,214	306	.....	88	2,668	7,886	2.06	2.39
	Marigold.....	14,762	4,564	3,661	2,079	5	25,071	996	350	.....	25	671	11,823	2.12	2.48
12	Hyacinth.....	14,936	4,578	5,663	1,349	184	26,710	1,586	1,826	.....	48	3,466	10,030	2.66	3.02
	Sumac.....	17,044	5,379	6,317	3,288	365	32,393	1,184	2,188	7	369	2,748	11,638	2.78	3.08
16	Fern d.....	1,120	827	.....	554	46	2,537	.....	.....	.....	.....	.....	25	.....	.....
17	Heather.....	19,246	5,227	4,965	1,861	92	31,391	8,670	2,857	.....	.....	11,527	8,078	3.99	5.31
18	Madrono.....	19,180	5,213	8,707	2,827	688	36,615	34	104	3	203	344	9,760	3.75	3.79
19	Columbine.....	21,747	6,486	12,048	2,865	75	43,221	5,243	3,023	6	28	8,300	13,139	3.28	3.72
	Total (30).....	415,077	130,008	136,258	68,845	7,799	728,073	62,976	36,508	576	4,221	104,311	272,334	2.71	3.06
	Average d.....	14,740	4,604	4,865	2,399	277	26,885	2,249	1,304	20	148	3,721	9,712	.....	.....

a Includes \$128 for fuel, ninth district.

b Put in commission May 21, 1915.

c Includes repairs in eighth district.

d Put in commission June 25, 1915.

e Average of 28 tenders only.

Contract was awarded May 4, 1915, for the construction of the first-class seagoing lighthouse tender *Cedar*, already mentioned, for service in Alaska. The contract calls for completion in May, 1916. Weekly reports of the vessel's progress are made to me by the officer representing the Department at the builder's yard.

The medium-draft tender *Laurel*, for service in the fifth lighthouse district (coasts of Maryland, Virginia, and part of North Carolina, including Chesapeake Bay), was completed during the fiscal year, and went into commission May 21, 1915.

The small tender *Fern*, for service in the inside waters of the sixteenth lighthouse district (Alaska), was launched on February 6, 1915, and completed during the fiscal year, proceeding to her station of duty on July 1, 1915.

Contract was awarded on November 6, 1914, for the medium-draft tender *Rose* for service in the bays and sounds of the seventeenth lighthouse district (coasts of Oregon and Washington, including Puget Sound). Work on the vessel was in progress at the close of the fiscal year.

With the increase in the number of aids to navigation and the deterioration of older vessels it will probably be necessary to construct on an average one or two new tenders each year. Estimate has been submitted for a new lighthouse tender to replace the present worn-out tender *Gardenia*, or for general service as may be found most desirable, at a cost of \$150,000.

Radio apparatus was designed and manufactured by the Bureau of Standards, with special reference to the particular duties of the Lighthouse Service, for the tenders *Columbine*, *Cypress*, *Orchid*, *Manzanita*, and *Sequoia*. It is intended to equip tenders with such apparatus as fast as possible. Installation was made on the *Columbine* and *Cypress*, but deferred on the other vessels owing to insufficiency of funds in the appropriation entitled "Salaries, lighthouse vessels."

The condition of this appropriation also necessitated the laying up of the tender *Lilac* until such time as more funds may be available.

During the fiscal year the following long voyages were made by lighthouse tenders, in connection with necessary transfers incident to the work of the Service: *Myrtle*, from New York to San Juan, P. R.; *Ivy*, from San Juan to Portsmouth, Va.; *Kukui*, from Honolulu, Hawaii, to Ketchikan, Alaska, via San Francisco and Seattle; and *Columbine*, from Ketchikan to Honolulu, by the same

route. In all cases the vessels were commanded by masters in the Lighthouse Service, and the transfer made without special incident.

New light vessels *No. 96* and *No. 98* were completed during the fiscal year. The former was assigned to station at Poe Reef, Lake Huron, Mich., in place of *No. 59*, condemned and sold, and the latter to station at Buffalo Entrance, Lake Erie, N. Y., in place of *No. 82*, lost in the storm of November, 1913. (See p. 115 of 1914 report.)

Contracts were awarded on March 6, 1915, for the construction of second-class light vessels *No. 101* and *No. 102*. *No. 101* is intended for general relief duty on the Atlantic coast and *No. 102* for station at Southwest Pass Entrance to Mississippi River, La. Good progress had been made by the builder up to the close of the fiscal year.

Plans are in preparation for the construction of light vessels *No. 99* and *No. 100*. One of these is intended for Nantucket Shoals, and it is my intention, in which the officers of the Lighthouse Service fully concur, that she shall embody the latest word that science and experience can say respecting the construction of light vessels. It is hoped, with the concurrence of the Secretary of Agriculture, to equip her for continued use as a weather-observation station, and possibly to provide that she may be used for other scientific purposes. It is my special desire that this vessel shall be in a sense a scientific outpost of the United States regularly contributing not only to the safety but to the knowledge of mankind.

Two lighthouses of special interest are now being constructed, noteworthy by the distance which separates them while under the control of one service and by the peculiar conditions in each case. One is on the stormy coast of Alaska, the other in the tropical waters of the Caribbean Sea.

The lighthouse for Cape St. Elias, Alaska, is being constructed on an almost inaccessible island which has long been a menace to navigation. The square tower stands on a shelf about 50 feet above water and will support a lantern whose focal plane will be 90 feet above the sea level. The illuminating apparatus consists of a three-mantle lamp of 180,000 candlepower, visible $15\frac{1}{4}$ nautical miles distant. There will be a fog signal consisting of a 6-inch automatic compressed-air siren, in duplicate, each with a trumpet with a two-way mouth. The characteristic of the light is a double white flash every 20 seconds. That of the fog signal is a double blast of 4 seconds each every minute.

The lighthouse on Navassa Rock, lying between Cuba and Haiti, is of an entirely different type. It is a reinforced concrete round tower over 150 feet high, standing on the top of a lofty rock island so that the focal plane of the lens will be 402 feet above water and will be visible 27 nautical miles. It lies in the path of vessels from New York and other eastern ports to the Panama Canal and will safeguard a passage largely used by navigators. The light will have 56,000 candlepower and will have as a characteristic a double white flash every 30 seconds.

Cooperation.

In accordance with the established custom of the Service, every effort has been continued to consult the needs of maritime interests and to cooperate effectively with other branches of the Government in matters relating to the work of the Lighthouse Service.

Through cooperation with the passenger steamer lines on Long Island Sound, Conn. and N. Y., regulation of steamer traffic was secured by establishing eastbound and westbound lanes of travel, the Service providing a special gas and whistling buoy, also a bell buoy, to assist in this work. These arrangements were put in effect during the fall of 1914, and in the opinion of navigators have been satisfactory in reducing the possibility of collision in the vicinity, particularly during fog.

The naval construction division has not only designed and prepared specifications for the new steamship *Cedar*, the finest vessel yet designed for lighthouse work in this country, but has also cooperated with the officers of the Coast and Geodetic Survey in designing and preparing plans and specifications for the new steamship *Surveyor*, intended for use in the survey of Alaskan waters, and has since the fiscal year closed designed and prepared the plans for the new steamer *Halcyon* for the Bureau of Fisheries.

The general depot of the Lighthouse Service at Tompkinsville, Staten Island, N. Y., has been of material assistance to the other marine services of the Department, being especially helpful in connection with the preparation of the Coast Survey steamer *Isis* for her work. The spirit shown by the officers and employees of the Lighthouse Service in thus cooperating to assist the other maritime bureaus of the Department has been admirable.

By Executive order of the President, three lighthouse reservations in waters adjacent to Puget Sound, Wash., were set apart

offices for lighthouses under the supervision of the Department of Commerce.

Agreements were entered into on the 12th of March, 1915, with the United States Forest Service for the restoration of certain parts of the reservations of the Great Lakes, where the land was formerly of the United States and is now used by the United States Forest Service and other purposes.

Agreements were made with the United States Service for the use of certain lighthouses of the Lighthouse Service for the use of the United States Forest Service for the same purposes as before. The same terms as before were made with the United States Service for the same purposes. Arrangements for the construction of a lighthouse on the coast of the United States were also made with the United States Service. Similar inspections of various lighthouses and vessels were made by officers of the Public Health Service during the year.

Cooperation with the United States Engineer officers in charge of other improvements in the river districts has been continued during the year.

Cooperation was had during the year with practically all maritime agencies of the Government, particularly the Navy Department, in the prompt reporting of all information affecting aids to navigation.

Legislation Enacted Affecting the Lighthouse Service.

The following is a summary of special legislation affecting the Lighthouse Service, other than appropriations, enacted during the fiscal year 1915:

The following works were authorized by the act of March 3, 1915, but no appropriations have as yet been made to carry out these works. Light at Dog Island, Me., \$3,500; improvements at Woods Hole Depot, Mass., \$30,000; improving aids, Hudson River, N. Y., \$100,000; improving aids, Sandy Hook, N. J., \$20,000; improving aid, Delaware River, Pa. and Del., \$20,000; improving aids, St. Johns River below Jacksonville, Fla., \$66,000; additional aids, Florida Reef, Fla., \$75,000; improving aids, Mississippi River below New Orleans, La., \$30,000; small tender and barge, eighth district, Texas and Louisiana, \$20,000; light and fog signal, Conneaut, Ohio, \$63,500; improving aids, Toledo Harbor, Ohio, \$15,000; improving aids, Fighting Island Channel, Detroit River, Mich., \$20,000; light and fog signal, Kellett Bluff, Henry Island,

Wash., \$40,000; improving aids, entrance to Coquille River, Oreg., \$6,000; light and fog signal, Point Vicente, Cal., \$80,000; aids to navigation, Pearl Harbor, Hawaii, \$80,000.

The act of August 22, 1914, authorized the transfer from the Interior Department of approximately 206 acres of land on the Queniult Indian Reservation, near Cape Elizabeth, Wash., for lighthouse purposes.

The act of March 3, 1915, granted authority for the following purposes:

The use of the unexpended balance of the appropriation of \$200,000 heretofore made for two tenders for general service for the construction of additional tenders for general service.

The transfer of a portion of the Tawas lighthouse reservation, Mich., to the Secretary of the Treasury for purposes of the Coast Guard.

The establishment of post-lantern lights and other aids to navigation on Lakes Okechobee and Hicpochee and connecting waterways across the State of Florida and on the Apalachicola River and Chipola cut-off.

Leave of absence for per diem employees who have served 12 consecutive months, under rules prescribed by the Secretary of Commerce.

Cooperation between the Lighthouse Service and the Forest Service in the management of forest land on lighthouse reservations.

Authorizing chief clerks in offices of lighthouse inspectors and persons designated by them to administer oaths to travel accounts or other expenses against the United States, and to administer oaths of office to employees of the Lighthouse Service.

The penalties provided by law for obstruction to or interference with any aid to navigation maintained by the Lighthouse Service are made applicable with equal force and effect to any private aid to navigation lawfully maintained under the private-aids act.

In connection with the work proposed at Woods Hole an explanation should be made.

This depot is well located on the Little Harbor, which is protected in all weathers, but there is not sufficient depth for tenders and deep-draft lightships to reach the dock. In September, 1915, I personally examined this site. The tender *Anemone* (the only one now on station) draws 13½ feet. The water is but 12 feet deep. Therefore the land and buildings owned by the Govern-

ments are in large part useless. For this reason a portion of a dock has to be rented in New Bedford, and a portion of the fisheries dock in the Great Harbor at Woods Hole has been used. Thus three separate stations are required in place of one, merely for lack of dredging the Little Harbor. This dredging would pay 10 per cent annually in cash saved on its estimated cost. Items of this saving are: Fifteen days' time annually wasted by the *Anemone* at a cost of \$100 a day going needlessly back and forth to New Bedford, also the additional cost of water, of which 40,000 gallons per month are used by the *Anemone*, the price being 25 cents per thousand gallons in Woods Hole and \$1 per thousand gallons in New Bedford. Furthermore, all supplies to be carried by the tender to the various stations have now to be transported in small boats to and from the station to the fisheries dock or to the tender. The rental of a dock at New Bedford costs \$150 per year. The painting and scaling of buoys, which should be done at the station, has now to be done upon the tender. This painting can not be done on shore as it should be done because the tender can not get in to land them and they are too large to be handled in small boats. This takes the equivalent of 30 days' time of the vessel, costing \$100 a day for maintenance, used in painting the buoys and scraping them, when this work should be done upon the dock, as it is elsewhere, at a cost of \$2 per day. Furthermore, at Woods Hole, Great Harbor freezes in winter and Little Harbor never freezes. In addition, the work of replacing aids has to be delayed by the additional time necessary to go to New Bedford and back. This means that many important aids to navigation which could be replaced on the same day if the tender could get them at Woods Hole require two days or more for replacing under existing conditions.

It is recommended that the channel and basin around the wharf be dredged to a depth of 17 feet at low water. It is also recommended that a brick storehouse, 35 feet by 80 feet, two stories high, with a half pitch roof, be built to replace the present wooden one, which is not adapted to the work and not large enough to accommodate the stock on hand.

This is a case where valuable Government property, ample for the purpose and well located, is largely left unused while at a wasteful cost other property is hired and still other borrowed and the work done with a maximum of inconvenience and inefficiency.

Duties of the Lighthouse Inspectors, and Their Inadequate Salaries (Omitting River Districts, Where the Inspectors are Army Engineers).

The act of June 17, 1910, provides that "a lighthouse inspector shall be assigned in charge of each district," and that "the lighthouse inspectors shall each receive a salary of \$2,400 per annum, except the inspector of the third district, whose salary shall be \$3,600 per annum."

Duties of inspector.—The "Regulations for the United States Lighthouse Service," prescribed in accordance with the act of June 17, 1910, charge the lighthouse inspector with the following duties:

The inspector is charged with the supervision of all the work of the district in which he is assigned to duty, and he is responsible under the Commissioner for its efficient and economical administration.

He is responsible for the proper management of the light stations, fog signal stations, light vessels, relief light vessels, lighthouse tenders, and depots; for keeping upon their stations in proper condition all floating aids to navigation; for the maintenance, repair, and operation of all lighthouse craft permanently or temporarily in the district; for the construction of new aids or additions to aids; for the repair, cleanliness, and efficient condition of all aids to navigation and other property in the district; for keeping ready for service at the shortest notice all spare or relief moorings, buoys, buoy appendages, and relief light vessels; for the distribution of supplies; for the efficiency of the personnel; for the approval of vouchers and accounts covering the disbursement of funds as may be authorized on account of the Lighthouse Service; and for such other duties as are involved in the proper conduct of the district or as may be from time to time assigned to him.

In carrying out these duties the inspector is to exercise a constant and watchful supervision over all district affairs, as well as over the officers and men in the service, so as to maintain the district in a high state of efficiency. He shall keep advised of the needs of navigation as respects aids to navigation in his district.

Responsibilities and work of inspectors.—

Government property, average value <i>per district</i> (estimated).....	\$3,000,000
Vessels, average number <i>per district</i>	7
General coast line, average length <i>per district</i> (miles).....	1,000
Aids to navigation <i>per district</i> , average.....	740
Employees <i>per district</i> , average.....	280
Annual disbursements, average <i>per district</i>	\$304,000

Qualifications of lighthouse inspectors.—Technical knowledge of work of the Lighthouse Service.

Business ability for economical and efficient handling of work.

Vigilance for protection of safety of navigation.

Engineering knowledge and experience, including practically all branches of engineering.

Nautical knowledge and experience.

and the fact of enormous initiative and responsibility in the administration of the legislative branch, to this, and to the fact of immensities in the territories.

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Summary of the State of the Union —

Salaries of the members of the House of Representatives	\$2,000
Salaries of the members of the Senate	5,000
Salaries of the members of the Supreme Court	5,000
Salaries of the members of the Executive Branch	4,000
Salaries of the members of the Legislative Branch	5,000
Salaries of the members of the Executive Branch	4,000
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It is not only the fact of enormous initiative and responsibility in the administration of the legislative branch, to this, and to the fact of immensities in the territories.

I do not expect the people of the United States, when these facts are brought to their attention or that of their representatives, will be willing to continue the material injustice which this state of affairs brings about. There are technical men, entrusted with proper jobs of great value and with the supervision of great areas, making large expenditures and bearing heavy responsibilities, who are distinctly underpaid for the work they do. I am personally acquainted with every member of this force. They are loyal public servants and are entitled not to a more generous, but the word "generous" would be sadly out of place in this connection, but to a more just compensation for the valuable services they render. Our estimates for the coming fiscal year have accordingly been made upon the basis of a moderate advance in compensation.

Backup of Life and Property.

During the fiscal year 1915 services in saving of life and property were rendered and acts of heroism performed by employees of the Lifebuoy Service on vessels or at stations on 143 occasions, a list of which follows:

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1915.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
ast.....	Tender Hibiscus.....	Schooner Harriet C. Whitehead.	Pulled vessel off Ram Island Ledge, Me.
	J. Burke, keeper, Cape Neddick Light Station, Me.	Unknown man.....	Saved man from probable drowning; furnished him with clothing and shelter.
	E. Reed, keeper, Whitehead Light Station, Me.	Motor boat.....	Recovered boat adrift near station.
	J. W. Jellison, keeper, Tenant Harbor Light Station, Me.	Motor boats.....	Towed 2 disabled boats to their moorings.
	Tender Hibiscus.....	Motor boat.....	Towed to port disabled boat with 2 men on board.
	Tender Zizania.....	Launch.....	Rescued launch, with 2 men aboard, caught in ice.
	Tender Hibiscus.....	Schooner C.W. Dexter.	Towed into harbor schooner found in dangerous position with rudder and 1 anchor and chain gone.
ad.....	H. C. Towle, keeper, The Graves Light Station, Mass.	Motor dory and motor boat.	Picked up disabled dory with motor boat in tow at East Point, Nahant, and towed to Bass Point; heavy sea.
	E. C. Mott, assistant keeper, Deer Island Light Station, Mass.	The Morning Star; F. McAlpine, owner.	Rescued 2 men from burning motor boat; furnished food, dry clothing, and lodging for the night.
	J. E. Barrus, keeper, and E. H. Hopkins, assistant keeper, Cape Poge Light Station, Mass.	Power yacht Langanate.	Assisted in working yacht off bar.
	Tender Anemone.....	Four-masted schooner Geo. F. Scannell, of New York.	Towed to channel schooner anchored in dangerous position, with distress signals up.
	Light Vessel No. 73, Mass....	Power boat; Frederic Nickerson, owner.	Rescued disabled boat and owner.
	Tender Anemone.....	Tug Henry Maurer, with tow.	Towed to Hyannis wharf disabled tug anchored with mud scow off Point Gammon.
	G. I. Cameron, first assistant keeper, and E. Mueller, second assistant keeper, The Graves Light Station, Mass.	.....	Furnished food and shelter for night to 2 officers and 6 sailors from ship who were unable to return on account of heavy wind.
	A. A. Howard, keeper, Stage Harbor Light Station, Mass.	.....	Saved horse from sinking in quicksand and water.
	E. C. Hadley, keeper, Bakers Island Light Station, Mass.	Motor boat.....	Furnished food to 2 Italian fishermen; also put engine in working condition.
	Tender Anemone.....	U. S. S. Celtic.....	Attempted to pull stranded steamer from shoals; unsuccessful.
	H. C. Towle, keeper, The Graves Light Station, Mass.	Motor dory.....	Towed to Lynn a disabled boat drifting to sea with fisherman aboard.
	J. B. McCabe, keeper, and E. C. Mott, assistant keeper, Deer Island Light Station, Mass.	.....do.....	Rescued fisherman in disabled boat.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1915—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
2d	J. E. Barrus, keeper, and E. H. Hopkins, assistant keeper, Cape Poge Light Station, Mass. Light Vessel No. 47, Mass....	Three-masted schooner Roger Drury.	Assisted schooner, which had struck $2\frac{1}{2}$ miles south of station.
	Light Vessel No. 73, Mass....	Dories from schooner Washakie.	Assisted and supplied food to 6 men adrift in dories from schooner.
		Dory from schooner Washakie.	Assisted and supplied food to 2 men adrift in dory from schooner.
3d	Ram Island Reef Light Vessel No. 23, Conn. A. Daunt, master, Bartlett Reef Light Vessel No. 13, Conn., and C. J. Murray, boatbuilder, general depot.	Power boat; D. Charter, owner. Barney Marsden.....	Went to assistance and towed disabled boat to safety. Rescued helpless man who had fallen off dock.
	W. F. Hill, keeper, Isle La Motte Light Station, Vt. E. M. Usinger, keeper, Stratford Shoal Light Station, N. Y.	Motor boat..... .....do.....	Towed ashore disabled boat, containing 3 persons. Rescued disabled boat; brought 3 men and 2 women to station; took care of occupants overnight.
	J. Smith, keeper, Duck Island Light, Conn.	Schooner Nettleton; Capt. Lamborn, owner.	Assisted in floating vessel ashore on Duck Island and taking boat to Saybrook.
	J. C. Bouley, keeper, Gull Rocks Light Station, R. I.	Boat from U. S. training station.	Took to place of safety, after 2 hours' work, boat drifting to sea loaded with sand and containing an exhausted man.
	A. G. Baldwin, keeper, Bridgeport Harbor Light Station, Conn.	C. A. Strat.....	Rescued from drowning in Long Island Sound.
	J. Petterson, keeper, Southwest Ledge Light Station, Conn., and G. Lepol, laborer, general depot.	Power boat.....	Towed disabled boat and 3 men to safety; rough sea and strong wind.
	W. J. Murray, keeper, Little Gull Island Light Station, N. Y.	Schooner Andrew Nebinger.	Assisted schooner stranded on reef; helped to place anchors.
	W. F. Petzolt, assistant keeper, Stratford Point Light Station, Conn.	Motor boat Hale.....	Took to safety disabled boat containing 2 boys.
	G. Ehrhardt, keeper, and J. Hamilton, assistant keeper, Long Beach Bar Light Station, N. Y.	Motor boat Kitty.....	Picked up abandoned boat; turned it over to civil authorities.
	J. B. Murdock, keeper, Rondout Light Station, N. Y.	Exhausted swimmer..	Assisted exhausted swimmer carried out of his course.
	L. P. Brown, keeper, Cold Spring Harbor Light Station, N. Y.	Open launch.....	Rescued and took ashore disabled launch and 4 occupants.
	Do.....	Canoe.....	Rescued 2 young men from filled canoe during heavy storm, and gave them supper, bed, and breakfast.

SAVING OF LIFE AND PROPERTY BY TENDERS IN EMPLOYERS OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1910—Continued.

District	Vessel or employer-rendering service	Tender, etc., aided	Nature of assistance
3d.....	W. L. Barry, keeper, and J. Morris, assistant keeper, New Haven Light Station, Conn.	Motor boat A. F. Owen and J. H. Burton, owners.	Rescued disabled motor boat and took men & occupants overnight.
	Tender Taliga.....	Day Tugboat "E" Brown.	Rescued and towed disabled tug to Liverpool Bay.
	E. E. Goldenshove, keeper, Saybrook Lynde Point Light Station, Conn.	Power boat.....	Assisted ashore & occupants & boats caught in ice saved for their overnight and assisted in repairing boat.
	T. J. Murray, keeper, Huguenot Meadows Light Station, N. Y.	Ice boat.....	Assisted ashore & men and 2 women whose boat had broken through ice supplied their needs at station.
	E. E. Goldenshove, keeper, Saybrook Lynde Point Light Station, Conn.	Disabled boat, Capt. J. Mulhoney	Saved and brought ashore boat, with broken timber, caught in ice, took care of occupants.
	Canfield Point Light Vessel No. 2, Conn.	Power boat.....	Towed disabled boat, with occupants, to light vessel; repaired engine.
	W. F. Rhodes, keeper, and V. H. Stanton, assistant keeper, Ramer Shoal Light Station, N. Y.	Canoe.....	Rescued 2 men and canoe caught in storm off Ramer Shoal and captured.
	W. H. H. Lake, jr., keeper, Shinnecock Bay Light Station, N. Y.	Boat.....	Assisted boat, with women occupants, off at shoal.
	L. P. Brown, keeper, Cold Spring Harbor Light Station, N. Y.	Open dory with sail, W. Hill, owner.	Went to assistance of 2 men in disabled boat, supplied oars and towed boat to Oyster Bay.
	J. J. Barnes, keeper, North Dumpling Light Station, N. Y.	Power boat.....	Pulled ashore boat and 2 occupants stranded ashore in strong wind before much damage done.
	J. A. Murdock, keeper, Rondout Light Station, N. Y.	Motor boat Natalie, J. H. Flannery, N. Y.	Assisted in raising sunken boat.
4th.....	W. Spear, keeper, Deep Water Point Range Front Light Station, N. J.	Drowned boy.....	Recovered body of boy drowned near station.
	H. C. Wingate, keeper, Delaware Breakwater Range Front Light Station, Del.	Drowning man.....	Rescued from probable drowning man fallen overboard from passing steamer.
	C. J. Murphy, engineer of Tender Iris.	.....do.....	Saved man from drowning.
	H. C. Wingate, keeper, and H. P. Marshall, first assistant keeper, Delaware Breakwater Range Front Light Station, Del.	Motor boat.....	Rescued 4 men drifting out to sea in disabled boat.
	G. A. Holston, laborer in charge, Lewes Lighthouse Depot, Del.	.....	Made 28-mile trip to sea to bring ashore fireman of Fenwick Island Plum Light Vessel.
5th.....	C. E. Respass, keeper, and E. Davis, assistant keeper, Windmill Point Light Station, Va.	Gasoline launch.....	Assisted occupants of disabled launch.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1915—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
5th	W. L. Rebbel, clerk, office of lighthouse inspector, fifth district.	J. W. Walsh, clerk, fifth inspector's office.	Attempted rescue of Clerk Walsh from drowning.
	M. Hudgins, keeper, and J. M. Ellis, first assistant keeper, Smith Point Light Station, Va.	Motor boat.....	Assisted 2 men when motor had become disabled.
	R. H. Bertram, master, Relief Light Vessel No. 2.	Power yacht Phalarope.	Assisted leaking yacht.
	J. T. Twiford, assistant keeper, Long Shoal Light Station, N. C.	Power boat Robena, Capt. S. Spencer.	Assisted disabled boat.
	T. H. Baum, keeper, Long Shoal Light Station, N. C.	Small sloop.....	Assisted occupants when sloop went aground.
	A. J. English, keeper, Harbor Island Bar Light Station, N. C.	Power boat Viola.....	Assisted disabled United States mail boat.
	L. H. Staubly, keeper, Blakistone Island Light Station, Md.	Sloop Volunteer.....	Assisted sloop in leaking and sinking condition.
	G. M. Willis, sr., keeper, Point No Point Light Station, Md.	W. Yeatman and child.	Rescued assistant keeper and child from drowning.
	U. B. Jennett, second officer, tender Jessamine.	Gasoline freighter Margaret Atkinson of Baltimore, Md.	Towed loaded disabled freighter into Annapolis.
	C. B. Gray, keeper, Greenbury Point Shoal Light Station, Md.	Canoe.....	Assisted 2 oystermen in capsized canoe.
	W. F. Outten, first officer, tender Woodbine.	.....do.....	Rescued 2 men from drifting canoe.
	J. Hanson, master, Relief Light Vessel No. 72.	S. S. Washingtonian..	Rescued 39 men from steamship rammed off Fenwick Island, Del.
	T. H. Baum, keeper, and J. T. Twiford, assistant keeper, Long Shoal Light Station, N. C.	Schooner Hamlet of Hatteras, N. C.	Assisted schooner run aground on Long Shoal, N. C.
	B. Wroldsen, quartermaster, tender Jessamine.	C. Gregory and C. Sawyer.	Rescued men from drowning after boat capsized in heavy squall.
	A. J. Davidson, first officer, and J. Whitehurst, second assistant engineer, Woodbine.	Tender Woodbine.....	Rendered prompt assistance in saving tender from fire.
	J. R. Monteiro, master, tender Ivy.	Schooners Mary S. Ewing and Julia and Anne.	Attempted to rescue schooner Mary S. Ewing in a gale; assisted schooner Julia and Anne.
	A. M. Thistel, master, Cape Charles Light Vessel No. 49.	Light Vessel No. 49...	Kept vessel on station, submarine signal and whistle in operation during heavy storm of Apr. 3, 1915.
	F. J. Pusey, mate, in charge of Light Vessel No. 97.	Motor boat.....	Assisted 4 occupants of disabled motor boat.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1915—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
5th.....	E. Mocklin, jr., keeper, and W. H. Etheridge, second assistant keeper, Beale Island Light Station, N. C.	Mail launch Swanton.	Assisted disabled launch with passengers aboard.
	R. L. Thomas, keeper, Tangier Sound Light Station, Va.	Motor boat Bernice L.	Rescued 3 men from boat sunk off station.
	W. R. Schoenfelder, keeper, Fishing Battery Light Station, Md.	Man overboard.....	Assisted man who fell overboard from dredge near station.
	A. J. English, keeper, and C. R. Austin, assistant keeper, Harbor Island Bar Light Station, N. C.	Schooner Davis, Davis, N. C.	Assisted schooner grounded on Harbor Island Bar, N. C.
	W. F. Outten, master, tender Laurel.	Schooner Alert, Seaford, Del., Capt. Winfield Scott.	Assisted schooner flying distress signals; towed her into Annapolis.
6th.....	Tender Mangrove, Master E. C. Tull, commanding.	Schooner Wm. H. Yerkes; Dunn Elliot Co., owners.	Brought ashore master and 10 of crew of wrecked schooner.
	Do.....	U. S. Engineers dredge Savannah.	Pulled dredge off shoals, St. Simon Sound, Ga.
	J. Robertson, keeper, and M. B. Wilder, assistant keeper, Little Cumberland Island Light Station, Ga.	Parties searching for bodies of crew of Rambler, wrecked near station.	Gave shelter and otherwise assisted searching parties.
	J. Lindquist, keeper, and W. Lindquist, assistant keeper, Mosquito Inlet Light Station, Fla.	Yacht Niagara of New York; J. S. Simmons, owner.	Took owner and family off yacht ashore in breakers; worked off yacht and took it to station.
	H. S. Svendsen, keeper, South Channel Range, etc., Light Station, S. C.	Launch; name and owner unknown.	Saved launch ashore on breakwater at Sullivan's Island, S. C.
	L. H. Bringloe, keeper, G. N. Jackson, first assistant keeper, and A. E. Burn, second assistant keeper, Charleston Light Station, S. C.	Launch.....	Assisted to station and took care of 4 fishermen; repaired launch.
	Do.....	Various small boats...	Furnished food and clothing to 30 fishermen washed ashore on Morris Island, S. C.
	C. P. Honeywell, keeper, J. B. Butler, first assistant keeper, and O. F. Quartermen, second assistant keeper, Cape Canaveral Light Station, Fla.	Steamer Loando; owner unknown.	Assisted ashore officers and crew of wrecked steamer; cared for 3 of crew at station.
7th.....	T. M. Kelly, keeper, J. P. Roberts, jr., first assistant keeper, and T. L. Kelly, second assistant keeper, Rebecca Shoal Light Station, Fla.	Steamers Nordvahlen and Veenbergen.	Assisted steamers ashore near station.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1915—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
7th	C. H. Gardner, keeper, Cedar Keys Light Station and Turning Point Light, Fla.	Rowboat.....	Rescued from drifting boat man apparently insane.
	H. P. Weatherford, keeper, and R. Palmer, second assistant keeper, Fowey Rocks Light Station.	Yacht May Belle.....	Rescued 3 passengers from yacht which sank immediately after rescue.
	Tender Arbutus.....	American steamer Standard.	Helped disabled steamer to raise anchor.
	C. G. Johnson, keeper, and H. A. Pierce, first assistant keeper, Sand Key Light Station, Fla.	Launch.....	Helped off rocks launch with 4 men aboard.
8th	Tender Camellia.....	Racing sloop Stranger; owner unknown.	Righted and towed to port boat capsized during squall.
	Mrs. M. R. Norvell, keeper, Fort Pontchartrain Light Station, La.	Man on steamer Hanover.	Brought to station man taken suddenly ill, and cared for him until death.
	Tender Sunflower.....	Schooner Maud B. Krumm; owner unknown.	Furnished provisions.
	G. R. Smith, keeper, and L. R. Smith, assistant keeper, Red Fish Bar Cut Light Station, Tex.	Launch.....	Assisted disabled launch; cared for the 4 occupants overnight.
	W. W. Bayly, keeper, Chandeleur Light Station, La.	Schooner Madeline; owner unknown.	Furnished shelter to woman and child taken from schooner which had gone ashore.
	Launch of Tender Myrtle...	Ferry launch Dicossa.	Towed to safety wrecked launch with passengers.
9th	J. M. Agostini, keeper, Catano Range and Anegado Shoal Range Lights, P. R.	Launch.....	Assisted disabled launch.
	E. T. O'Melia, former chief clerk.	Canoe.....	Saved man from capsized canoe.
	J. C. Belden, keeper, Rock Island Light Station, N. Y.	Large power boat.....	Rescued disabled boat with 5 men on board.
10th	Do.....	Launch Indunno of Gananoque, Ontario.	Repaired disabled launch towed to station.
	Do.....	Launch.....	Assisted stranded launch into deep water; furnished bed and breakfast for 2 occupants.
	B. A. Dissett, first assistant keeper, Toledo Harbor Light Station, Ohio.	.....do.....	Towed ashore launch with 8 men aboard, disabled and in dangerous position.
	C. Duggan, keeper, South Bass Island Light Station, Ohio.	Steam barge Isabel Boyce.	Assisted in landing and cared for crew of 8 from burning barge.
	R. C. Graves, keeper, Galloo Island Light Station, N. Y.	Small power boat.....	Towed launch 4 miles for supply of gasoline.
	P. Ritter, keeper, Sandusky Bay Inner Range Light Station, Ohio.	Two launches.....	Towed to safety disabled launch with 1 occupant, and motor boat with 4 upants.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1915—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
10th	C. H. Tucker, keeper, Oswego Light Station, N. Y.	Rowboat.....	Brought to station 2 women rescued from drowning.
	H. E. Walts, keeper, Sunken Rock Light Station, N. Y.	Skiff.....	Rescued man in skiff from being run down by steamer.
11th.....	R. Carlson, keeper, Whitefish Point Light Station, Mich.	Steamer Ora Endress.	Rescued 11 men from capsized vessel; provided food and clothing at station.
	W. G. Marshall, keeper, and F. McFall, assistant keeper, Windmill Point Light Station, Mich.	Launch.....	Pulled launch at sea well out of reach of heavy sea.
	J. Metivier, keeper, and L. Hudak, third assistant keeper, Spectacle Reef Light Station, Mich.	Motor boat Effie.....	Towed disabled launch to shore.
12th.....	E. C. Johnson, assistant keeper, Calumet Pierhead Light Station, Ill.	Sloop Rascal.....	Assisted drifting sloop with 3 men on board.
	J. M. Robinson, keeper, and H. Osby, first assistant keeper, Calumet Harbor Light Station, Ill.	Motor boat T. Bradwell.	Assisted disabled motor boat with 6 men aboard.
	S. M. Danielsen, keeper, Chicago Harbor Light Station, Ill.	Gasoline launch The Bug.	Assisted launch, with 1 man aboard, from drifting out into lake.
	G. Fox, second assistant keeper, Chicago Pierhead Range Light Station, Ill.	Drowning man.....	Rescued man who fell from dock near station.
	F. A. Drew, keeper, and G. W. Drew, assistant keeper, Green Island Light Station, Wis.	Gasoline launch Alice W.	Towed disabled launch to safety.
	Do.....	Motor boat.....	Assisted 4 men in leaky boat.
	Do.....	.....do.....	Brought to safety 2 men and 1 woman in disabled boat.
	F. A. Drew, keeper, Green Island Light Station, Wis.	Gasoline launch Wesley L.	Assisted grounded launch.
	G. H. Sheridan, keeper, Kalamazoo Light Station, Mich.	Open gasoline launch Quindess; J. D. Annable, owner.	Rescued 3 women and 4 men; brought launch to safety.
	Do.....	Gasoline launch Lady Ramor; P. Sholtz, owner.	Assisted launch, with 3 women and 3 men aboard, ashore during gale.
	A. C. Erickson, keeper, Little Traverse Light Station, Mich.	Motor boat.....	Towed to safety disabled launch with 2 men aboard.
	Do.....	Gasoline launch patrol boat No. 4; State of Michigan, owner.	Towed disabled launch into dock.
	J. Napeizinski, keeper, Manitowoc Breakwater Light Station, Wis.	Dredge and scows; Greiling Bros., owners.	Assisted in floating grounded dredge and scows.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1915—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
18th	T. Robinson, keeper, Muskegon Pierhead Range Light Station, Mich.	Motor boat Bohemian Girl.	Assisted disabled motor boat with 2 boys aboard.
	J. M. Marshall, keeper, and J. H. Sullivan, third assistant keeper, White Shoal Light Station, Mich., and W. Barnum, first assistant keeper, Old Mackinac Point Light Station, Mich.	Launch Ida L.....	Saved launch during gale.
	G. M. S. Hansen, keeper, Sheboygan Pierhead Light Station, Wis.	Rowboat.....	Brought ashore 2 men and capsized boat.
	L. Bourissau, keeper, W. F. Green, first assistant keeper, O. E. Dame, second assistant keeper, and F. L. Moore, third assistant keeper, South Fox Island Light Station, Mich.	Motor boat.....	Brought ashore and repaired disabled sloop; cared for 1 man, 1 woman, 2 children overnight.
	J. Fountain, keeper, and W. Hall, assistant keeper, St. Helena Light Station, Mich.	.....do.....	Assisted 2 men in leaking boat.
	Do.....	.....do.....	Towed disabled launch to safe harbor.
	C. H. Hubbard, master, and crew of tender Sumac.	Steamer Joseph C. Butler.	Assisted steamer; carried into shoal water.
	H. R. Bevery, keeper, J. Lonne, first assistant keeper, and W. H. Nash, second assistant keeper, Wind Point Light Station, Wis.	Motor boat Jeanette N; K. A. Nelson, owner.	Saved launch in rough sea.
	A. Van Velzen, first assistant keeper, Chicago Pierhead Light Station, Ill.	Drowning man.....	Saved from drowning man who fell from pier.
	E. Pecor, first assistant keeper, and D. O. Kinyon, second assistant keeper, Tree Point Light Station, Alaska.	Launch Cora; C. Nelson, owner.	Furnished oil, gasoline, and provisions to enable boat and occupants to reach Ketchikan.
	N. S. Douglas, keeper, and G. Tibbets, assistant keeper, Lincoln Rock Fog Signal Station, Alaska.	C. Sands, trapper.....	Gave provisions to trapper, whose food had become exhausted.
19th.....	Do.....	R. S. Mowin and C. Gorden.	Cared for party, hungry and nearly frozen, who had lost their launch.
	W. J. Pearson, first assistant keeper; W. A. Phillips, second assistant keeper, and W. Rosenberg, substitute keeper, Cape Sarah Light Station, Alaska.	Coast Guard Service S. S. Manning landing boat.	Cared for late keeper of station during illness; attempted to rescue persons when landing boat capsized.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1915—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
17th.....	O. H. Wayson, assistant keeper, Smith Island Light Station, Wash. E. A. Brooks, keeper, New Dungeness Light Station, Wash. Tender Heather, Capt. E. Hammerstrom. J. M. Coleman, keeper, Tongue Point Lighthouse Depot, Oreg.; O. Hoveden, temporary laborer at depot; and G. Pearson, laborer in charge of lights on Columbia River.	Motor boat..... Steamer Sioux..... 2 fishing boats..... Upturned boat.....	Towed ashore boat with 4 occupants, Assisted steamer and took off passengers. Convoyed boats to Astoria from Columbia River bar. Rescued man clinging to upturned boat.
18th.....	Tender Madrono..... Keepers, Pigeon Point Light Station, Cal. Crew of San Francisco Light Vessel No. 70.	Navy tug Vigilant.... Gasoline fishing boat; Union Fish Co., owners. U. S. Navy launch Castro.	Towed disabled tug off beach at Goat Island. Hauled boat off rocks and transported it to safety. Rescued man fallen overboard.

COAST AND GEODETIC SURVEY.

The former Superintendent of this Service, Dr. Otto H. Tittmann, resigned on April 14, 1915, after 48 years of fruitful service in various capacities. Mr. Frank Walley Perkins, who had been Assistant Superintendent for 14 years and had been connected with the Survey 52 years, resigned March 23, 1915. Capt. Robert Lee Faris was promoted to Assistant Superintendent March 8, 1915, after 22 years' service. Dr. E. Lester Jones, theretofore Deputy Commissioner of Fisheries, was appointed Superintendent of the Coast and Geodetic Survey, and was sworn in April 15, 1915.

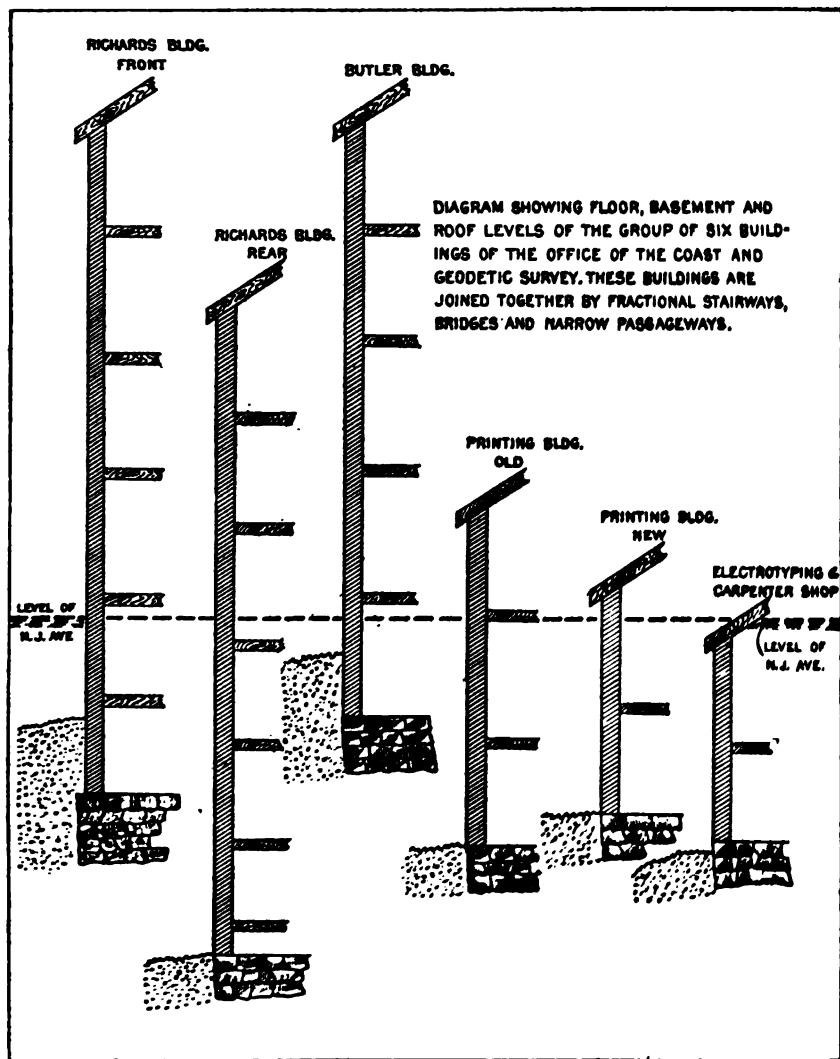
Old Buildings.

It is an old story to again call attention to the inadequate conditions afforded this Bureau in the buildings at present occupied, which cover 70,000 square feet of floor space, distributed in such a manner that work is difficult and expensive. One of these buildings was built for a hotel, and it is cut up into so many small rooms that the partitions take up much space. Because of this, no division can be properly supervised, with the possible exception of the new printing section. The buildings are 5 and 6 stories high, respectively, with 16 different levels in one and 11 in the other; and without any suitable elevator. They are improperly lighted and are overcrowded. One of the worst features about them is the fact that they are not fireproof, and records that cost millions of dollars and could not be replaced short of the expenditure of other millions of dollars are constantly in danger. To remodel these old structures would avail nothing; rebuilding is the only means of providing permanent relief. The efficiency of the Bureau is daily disturbed by the incommodious office conditions and by the inconvenience and loss of time involved in communication between widely separated portions of the buildings.

The foregoing statement can not be overemphasized. The further expenditure of money on these old buildings would be an actual waste, for while they are made by care to look well to the casual caller they can not be made to work well. The accompanying illustration shows

ement, and roof levels of

the group of six buildings which house this service. No sane factory manager would attempt to run any kind of a productive plant in such premises longer than necessary to replace them. Were there such a function as a public incendiary, these buildings are among the first that should receive his official attention. They are heated



by antiquated low-pressure boilers which must either be replaced by new ones at a cost of \$2,000 or be again ineffectually repaired at a cost of \$1,000. To do this last would be simply to throw away money. The present conditions require the expenditure of \$1,400 per annum for coal to heat the Richards Building and force

the Treasury Department to expend about \$1,000 per annum for coal to heat the Butler Building, two-thirds of which the Coast and Geodetic Survey occupies.

The facilities for handling this coal are of a prehistoric type, warranted to cost the most with the least result. The coal is dumped from trucks into bins under the parking at the front of the building. Thence it is taken in wheelbarrows over a tortuous route to the boilers at the rear of the buildings. This is done in the open air, without protection from the weather. There is no place to store coal near the boilers. Meanwhile a branch line from the heating main of the central power and heating plant, from which heat is supplied to all the buildings under the supervision of the Superintendent of the Capitol, runs directly through the buildings occupied by the Coast and Geodetic Survey. Whether this condition is humorous or tragic may be a question. Heat is there in abundance, to be had for tapping a pipe. Meanwhile the ridiculous process now in use goes on because that pipe may not be tapped. One wishes for the ready pen of a humorist to describe this fine example of how things should not be done.

It is recommended that authority be given to tap this heating main to permit the wasteful, ancient boilers now in use to be discarded and to allow the room these fossils occupy to be turned to some useful purpose. This will save the Government \$2,460 per annum in addition to the time and labor required for the care of the present boilers. It will also save annoyance from smoke and ashes during operations which ought not to be subjected to such annoyances, and will lessen the danger from fire.

The Coast Survey uses in a portion of the premises occupied by it electric current furnished from the Capitol Building, a practice which began at the time of the Spanish War, before the present power plant for the Capitol was erected. For the rest of the premises it pays a private producer for electric current.

There is an electric main belonging to the Government directly across the street. It is recommended that a connection to this main be permitted in order to save the money now paid to private parties.

With Government heat and light thus near at hand—indeed, in one case passing through the building—while on the other hand separate expense is incurred for both, one wonders what would be said of the practical efficiency of the management under which such things are allowed to continue. However, legislation is required before this condition can be amended.

Vessels.

I spoke plainly in my report for the last fiscal year of the condition of the vessels of this Service. Congress made an appropriation pursuant to which the fine seagoing yacht *Isis* was purchased in the spring of 1915 to replace the ancient *Endeavor* in the work of the Coast Survey in Atlantic waters. The *Endeavor* has been condemned and sold. The *Isis* was purchased with her equipment for about one-fourth of her original cost, though in sound condition, and has been for months at work without material change. She is a vessel of which any service might be proud, and as a working tool will do more and better work in a month than her predecessor could do in a year. She will be engaged in offshore work on the Atlantic coast.

A contract has been let, as already noted, for the construction of a new steamer known as the *Surveyor* for the Pacific coast and Alaska service. She will replace the *McArthur* of ancient memory, which has been ordered condemned and sold. This is a good beginning, but it leaves the Service in bad shape till more is done. The old *Gedney*, a veteran of 40 years' service, known to be unseaworthy, has also been ordered to be condemned and sold. The *Patterson* will no longer be used in exposed waters. She was lightly built 33 years ago and underpowered.

The necessary withdrawal of the *McArthur* before the *Surveyor* can take her place and the condemnation of the *Gedney* will leave the Service during the working season of 1916 short of two vessels—such as they were. We must try to keep the *Patterson* in use two years more in the protected waters of southeast Alaska. The *Explorer* also shows structural weakness and must be kept out of harm's way. So far as the urgent work which is needed off the coasts of Washington, Oregon, California, and Alaska is concerned, therefore, the service is practically short four vessels. Until the *Surveyor* is in commission and other similar ships are built, we can not hope to do any of this work, for there is not now a vessel in the Pacific coast service sufficiently seaworthy to expose her to the risk of work in the open sea. Therefore, our estimates for the coming fiscal year include the cost of two new ships urgently required for the work necessary for the charting of the unsurveyed and exposed offshore portions of the coasts of our Pacific Northwest and Alaska.

An economy is possible by making funds for ship construction immediately available which may be lost if the use of same is with-

held until the opening of the fiscal year. This economy may take the form both of time and money. In such conditions as now exist the lapse of a month in placing contracts may mean an increase in price of some thousands of dollars and the delay of a number of months in the completion of the ship. To illustrate: Inquiry was made of a prominent shipbuilding company whether they would duplicate for the Coast and Geodetic Survey the ships they were building for the Coast Guard. The answer was that they could not consider so doing, for the Coast Guard vessels had been taken at a time when work was slack and it was necessary to keep their organization together. A very considerable increase in price was therefore demanded.

A table follows showing the vessels in the Coast and Geodetic Survey Service on September 20, 1915.

Atlantic coast, Gulf of Mexico, Porto Rico, and Panama:

Isis (new).

Bache.

Hydrographer.

Matchless (schooner).

Pacific coast, Alaska, and Hawaiian Islands:

Patterson (weak).

Explorer (weak).

Godney (condemned).

McArthur (condemned).

Taku (large launch).

Yukon (large launch).

Cosmos (launch).

Philippine Islands:

Pathfinder.

Fathomer (owned by Philippine government).

Marinduque (owned by Philippine government).

Romblon (owned by Philippine government).

Research (owned by Philippine government).

Building at Manitowoc Ship Building & Dry Dock Co.:

Surveyor.

The insufficient complement and equipment for our vessels at times seriously disturbs the efficiency of the work. The enlisted men on the Pacific coast (particularly the seamen and firemen) are paid less than any other service, either Government or commercial. Union wages for seamen in the coastwise trade, which control the rates paid in the merchant-marine service, are \$45 to \$53 per month and found, with double pay for overtime. The Lighthouse Service pays seamen \$50 per month and 45 cents rations, excepting Alaska, where the pay is \$55 and the rations 60 cents, and in addition furnishes its seamen with oilskins and sea boots. The Coast Guard seamen \$44 per month

and rations of 48 cents per day. The Coast and Geodetic Survey pays its seamen \$40 per month and 45 cents rations. The men of this service are furthermore not assured of continuous work throughout the year, as insufficient funds make it possible to retain only the number needed to carry on part of the work.

It is, therefore, extremely difficult when recruiting in the spring to get even moderately good crews, and it is impossible to build up a permanent organization of reliable men experienced in the specialized work which they are called upon to perform, and sufficiently devoted to the service, by reason of permanent association with it, to perform willingly and without protest the extremely arduous work which the exigencies of the service often demand. The crews on the Pacific coast have to be recruited at Seattle at the time of the year when men of the type we seek are in greatest demand by the lumber interests, the canneries, and the fishing fleets, which are then getting ready for their summer work. It is not an exaggeration to say that 70 per cent of the men we get on the Pacific coast come to us as a last resort. We constantly lose time through lack of men trained in the work of the service. The surveying vessel with her appurtenances is a complex and complicated affair, and requires corresponding skill to keep her in condition. Much of this work is such that it can not be done when working in the field, and this is another reason why trained men should be kept on these vessels the year around.

If the "chief of the party," who is the commanding officer of the vessel, is allowed to build up a more or less permanent organization composed of such men as are needed for efficiency, then in due time he can be relied upon to greatly increase the amount of work turned out by his vessel and to reduce the unit costs.

The following table shows the pay of seamen in the Coast and Geodetic Survey, the Lighthouse Service, the Coast Guard, and the merchant marine on both the east and west coasts:

Service.	East coast.		West coast.	
	Pay per month.	Rations per day.	Pay per month.	Rations per day.
Coast and Geodetic Survey.....	\$30.00	\$0.45	\$40.00	\$0.45
Lighthouse Service.....	35.00	.45	50.00	.45
Coast Guard.....	36.00	.45-51	44.40	48 up.
Merchant marine.....	35.00	.50	45.00-53.00	Rations.

* Alaska, pay, \$55; rations, 60 cents.

† Rations at Juneau, 39 cents.

COMPARISON OF PRESENT MONTHLY RATES OF PAY OF ENLISTED MEN IN COAST AND GEODETIC SURVEY WITH SIMILAR RATINGS IN THE COAST GUARD, BUREAU OF LIGHTHOUSES, AND MERCHANT MARINE.

Rating.	Atlantic coast.				Pacific coast.		
	Coast Survey.	Light-house Service.	Coast Guard.	Merchant marine.	Coast Survey.	Light-house Service.	Coast Guard.
Assistant to engineer, second class.....	\$55.00	.....	\$75.00-110.00	\$75.00-80.00	\$75.00	.....	\$75.00-110.00
Assistant to engineer, third class.....	40.00	\$50.00	44.40	75.00-80.00	60.00	.....	.....
Boatswain.....	65.00	.....	75.00-110.00	.....	75.00	.....	75.00-110.00
Boatswain mate, chief.....	50.00	.....	75.00-110.00	.....	65.00	.....	75.00-110.00
Boatswain mate, first class.....	40.00	.....	75.00-110.00	.....	55.00	.....	75.00-110.00
Boatswain mate, second class.....	35.00	.....	75.00-110.00	.....	50.00	.....	75.00-110.00
Coxswain for power launch.....	35.00	.....	38.40	.....	45.00	.....	46.80
Quartermaster, first class.....	40.00	45.00	44.40	.....	50.00	\$55.00	54.00
Quartermaster, second class.....	35.00	45.00	40.80	.....	45.00	55.00	50.40
Quartermaster, third class.....	35.00	45.00	.....	45.00	45.00	55.00	.....
Seamen.....	30.00	45.00	36.00	35.00-40.00	40.00	55.00	44.40
Seamen, ordinary.....	25.00	.....	28.80	.....	35.00	.....	38.40
Writer, first class.....	40.00	.....	.....	.....	50.00	.....	.....
Writer, second class.....	35.00	.....	.....	.....	45.00	.....	.....
Wireless operator, first class.....	40.00	.....	68.00	.....	65.00	.....	68.00
Wireless operator, second class.....	40.00	.....	40.00	.....	45.00	.....	50.00
Mess attendant, first class.....	20.00	30.00	21.60	.....	35.00	.....	.....
Mess attendant, second class.....	16.00	.....	18.00	.....	30.00	.....	21.60

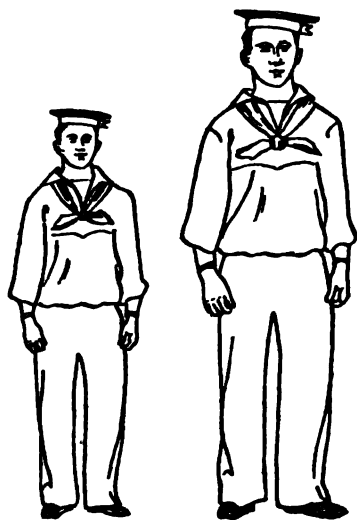
It will be noted that seamen are not paid as much as by other departments of the Government service and the merchant marine. To do this will require a material increase in the appropriation "For all necessary employees to man and equip the vessels."

The attached diagram shows relatively the men, ships, and coast line of the British Isles and those of the United States and Alaska.

Geodetic Work.

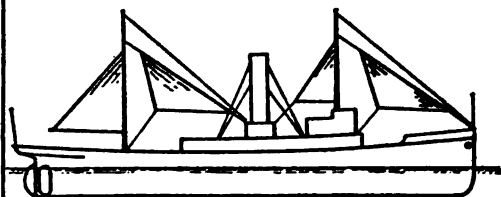
The question whether the geodetic work in the United States can be done by the individual States must be answered in the negative. This work involves primary triangulation and precise leveling. The former is the process of determining the correct distances between points. The latter is the process of determining exact elevations with reference to the sea.

It is necessary to have both primary triangulation and precise leveling in each State for the framework of State and county boundary surveys, for national and local topographic, drainage,

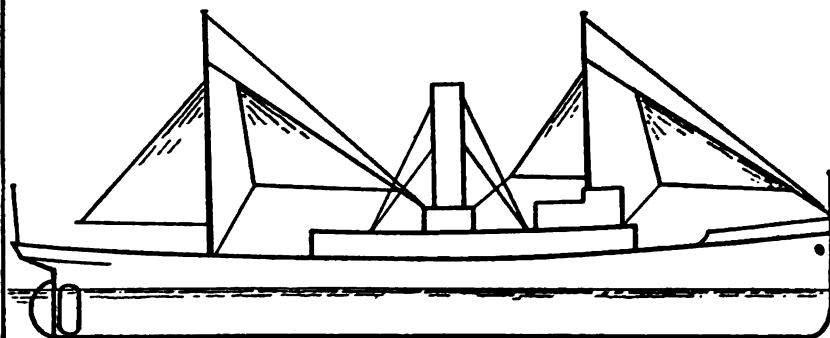
UNITED STATES
and ALASKA

BRITISH ISLES

Diagram of Men, Ships and Coast Line of the British Isles, and of the United States and Alaska, showing relative number of surveying officers and men, tonnage of surveying vessels, and the coast line covered by their respective surveying services



UNITED STATES and ALASKA



BRITISH ISLES

Coast line of the
United States and Alaska

Coast line of the British Isles

irrigation, mineral, and other surveys, and for various engineering operations. The necessity for this primary control we must accept as a fact, in view of the experiences of other nations as well as of our own.

The United States is divided into 48 States, some of which are relatively small in area. Each of the long arcs of primary triangulation and each of the lines of precise leveling traverses several States, and it would be difficult, to say the least, to obtain the cooperation at one time and in the same way of all of the States involved in any one arc or line. For example, the trans-continental arc of primary triangulation passes through 14 States; the Texas-California arc crosses 4, and the ninety-eighth meridian arc goes through 6. A similar condition obtains with regard to the long level lines.

Were each State able and willing to do that part of the primary triangulation and precise leveling within its own area, how then could there be a comprehensive scheme for the whole country? It would be absolutely necessary to have a national geodetic association, with each State represented in it, and with a central bureau to direct its operations. If each State worked independently, there would be little or no agreement with the work in adjoining States, and the gaps and overlaps at the boundaries would be a constant source of trouble to surveyors and map makers. Another annoying feature would be the lack of uniformity in the results of the work, as each State would be free to adopt its own standards of accuracy, if there were no supervising bureau. It would require many decades to complete the work, even if executed by the cooperation of all the States, each covering its own territory, and then a central organization would be necessary to adjust the work of the States and obtain from it a comprehensive whole.

Let us consider the experience of Australia. For years each State of that country conducted its independent geodetic surveys, with the result that, at a conference of the surveyors general held in 1912 at Melbourne, a resolution was adopted recommending that the geodetic survey be carried on by the Commonwealth.

The only conclusion possible is that our National Government must complete the general program which is being followed by the United States Coast and Geodetic Survey. This plan is, briefly, that the primary triangulation scheme and the precise level net should be so extended that there will be no place in the

United States distant more than about 100 miles from a primary triangulation station and from a precise level bench mark.

Whether the National or State Government should execute the control work in the intermediate areas is another problem. Many of these areas will lie wholly within single States and, as far as State and local surveys and engineering works are concerned, the States could properly supplement the fundamental schemes. However, to carry on geodetic work requires a corps of highly trained specialists and an expensive instrumental equipment, besides trained experts to compute and adjust the results. The State engineering departments are not at present equipped for this work. For some time, therefore, after the primary triangulation and precise leveling are completed the National Government must furnish additional control for the lesser surveys and engineering.

Greater New York called for an officer of the Coast and Geodetic Survey to direct the primary triangulation of its area. The Survey cooperated because the results were of value in the revision of charts in the vicinity of New York City. The city of Cincinnati requested the Coast and Geodetic Survey to detail an officer to direct the primary triangulation and precise leveling of that city, but as the Survey could not do this the city employed a former officer of the Coast and Geodetic Survey to take charge of the work. Several years ago the city of Memphis requested the Survey to extend a primary triangulation over its area, and during the past winter Richmond requested the Survey to cooperate with it in making primary triangulation and precise leveling over its area. In the case of Cincinnati, Memphis, and Richmond the problem was not similar to that of New York, as the results would not be of value to the Coast and Geodetic Survey in its charting work. However, in the case of Memphis an arc of primary triangulation was carried to that place, from which the city may be triangulated. This arc is in the general scheme which the Survey proposes to extend over the whole country eventually.

Atlanta, Ga., and Lufkin, a town in Texas, have recently requested that precise leveling bench marks be established by the Coast and Geodetic Survey for the basis of city surveys and maps. This the Survey can not do now for lack of funds.

The National Government spends several millions of dollars annually for surveys and maps of various kinds. The efficiency of this work will be materially aided by having the fundamental

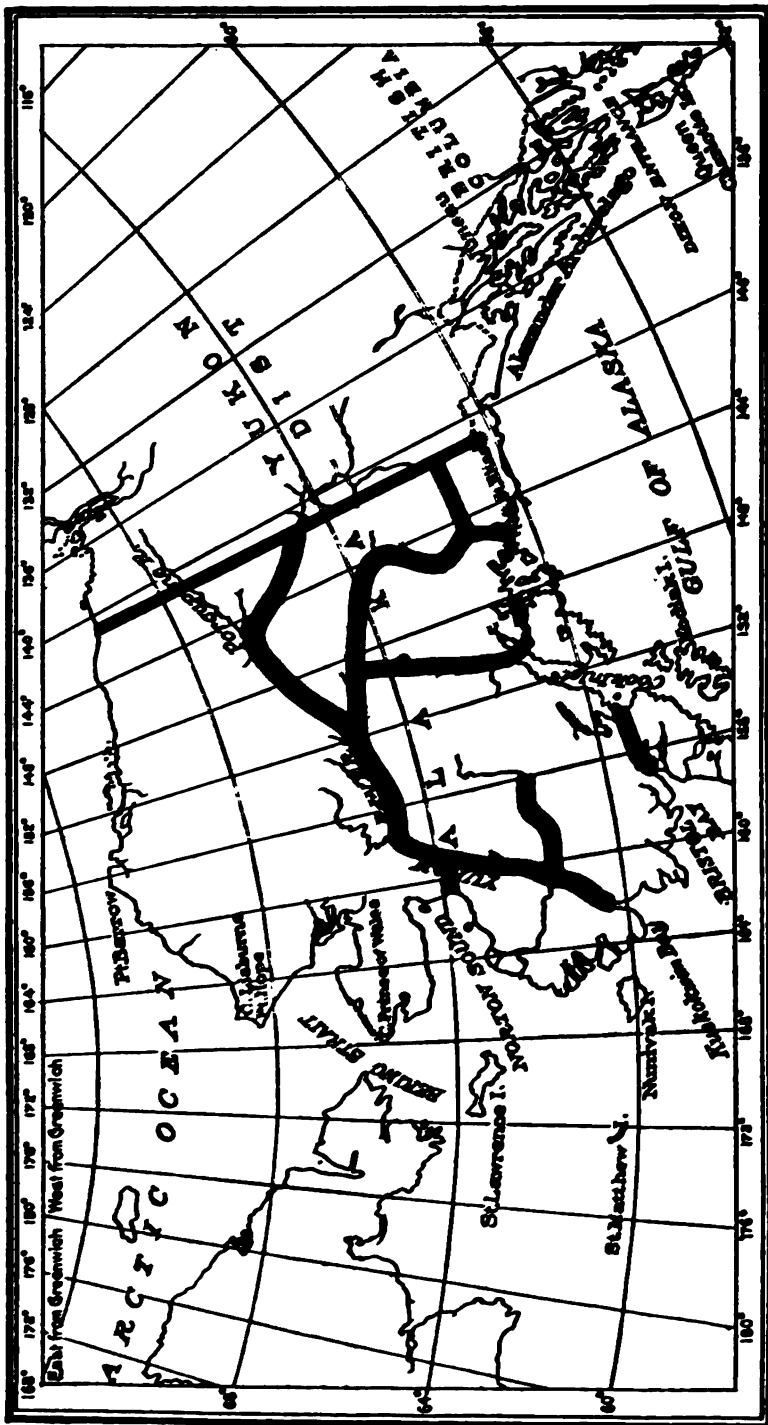
control extended rapidly. Accurate surveys and maps are national assets and aid materially our industrial development. Primary triangulation and precise leveling are not of immediate value only, for their monuments and bench marks may be used repeatedly for an indefinite time, and in any given area will probably never have to be duplicated. The National Government can well afford to adopt a plan of carrying the fundamental geodetic control to a rapid completion, as only about one and one-quarter million dollars are needed to finish the geodetic work here contemplated. If this work could be done at all by the several States, the field and office work and the overhead charges would no doubt cost several times this amount and the great delays would make the nation the loser by much more than the cost of the work.

The necessity is immediate of having precise levels and primary triangulation extended along the principal rivers in Alaska. This Territory is rapidly developing, and if primary triangulation and precise leveling can be carried into the interior ahead of the detailed surveys much money will be saved.

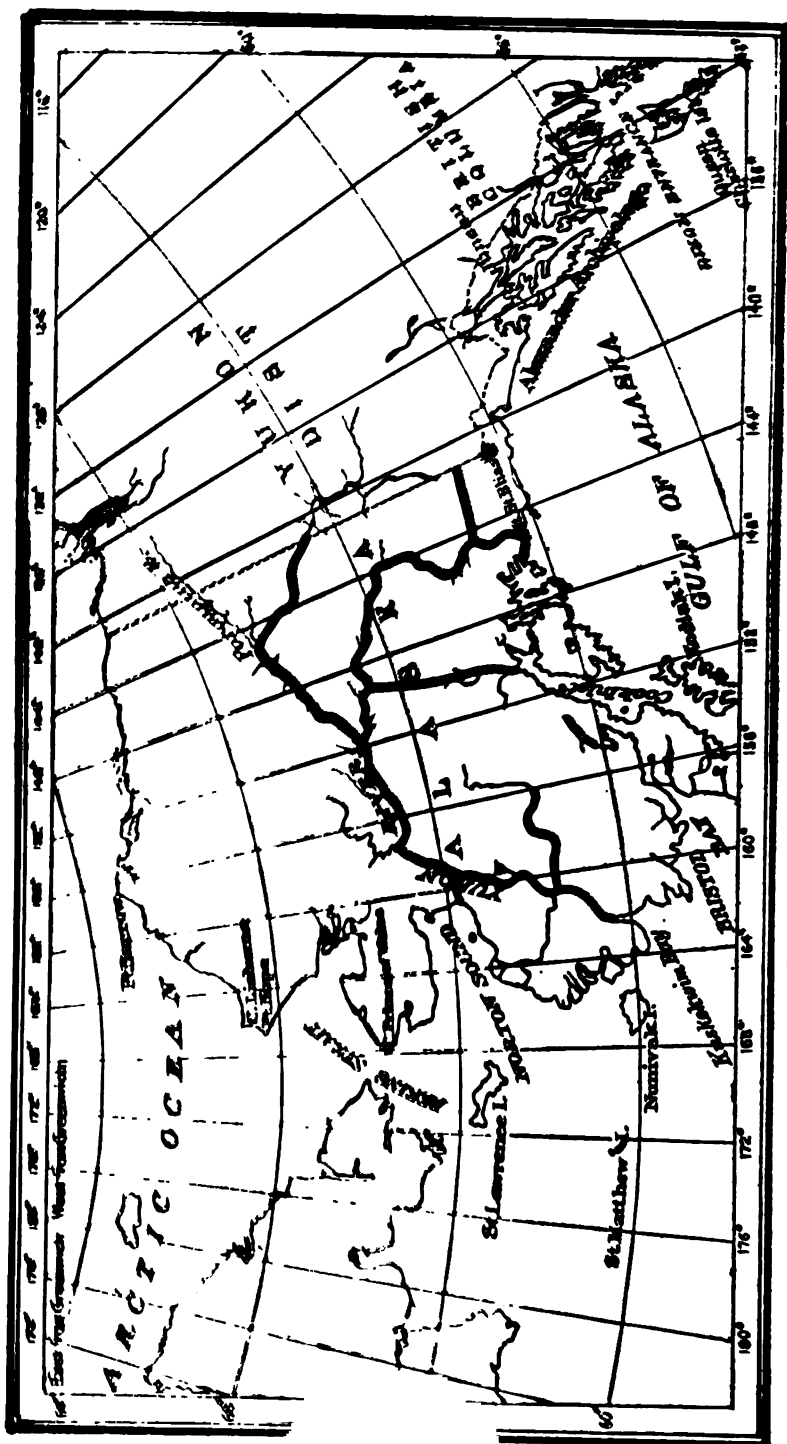
In addition to the triangulation and leveling in the interior of Alaska, there is needed a triangulation across the Alaska peninsula connecting Cook Inlet and Bristol Bay.

It is recommended that a primary triangulation be carried from Dixon Entrance northward to White Pass at the head of Lynn Canal, Alaska, and also that the triangulation of Puget Sound and other waters between Point Roberts and Tacoma be strengthened. These two pieces of work are portions of an arc of primary triangulation which will connect Alaska with the United States. The Canadian Government is now undertaking a primary triangulation to extend from Dixon Entrance southward to Point Roberts. If the United States will extend the triangulation to White Pass, as mentioned above, it is understood that the Canadian Geodetic Survey will then carry the triangulation from that point down the Yukon River to a connection with the one hundred and forty-first meridian triangulation in the vicinity of Eagle City. The desirability of having all of the triangulation of North America on the North American Datum is apparent to all who have to use the results of triangulation in surveys and maps.

For the purpose of carrying on the triangulation and leveling in the interior of Alaska there should be appropriated, specifically for this object, about \$25,000 per annum until the work is completed.



PRIMARY AND SECONDARY TRIANGULATION NEEDED IN ALASKA NOW.
(Work along 141st meridian has been done by Boundary Commission.)



PRECISE LEVELING NEEDED IN ALASKA NOW.

The item of the appropriation bill, "Party expenses, Pacific coast," should be sufficiently large to permit of \$10,000 being used on the triangulation along the coast between Dixon Entrance and White Pass and between Tacoma and Point Roberts; also for the connection between Cook Inlet and Bristol Bay.

There is also needed triangulation revision along the Atlantic coast of the United States and a slight amount on the Gulf coast. The triangulation there is old and many of the points have been destroyed. Such should, in most cases, be reestablished. Until recent years the mark of a triangulation station was not of a permanent character. When a concrete mark is used without something to designate its purpose, it is apt to be destroyed by thoughtless persons who imagine it is a mark for buried treasure. Many important stations have been lost for this reason. Practically all of the stations of the Survey are now marked by an inscribed metal disk set into the concrete or solid rock, which allays any curiosity the visitor may have. Wherever old stations are found along the coasts, they should be re-marked in a modern and substantial manner. About \$5,000 as a minimum should be available each year for the revision of triangulation on the Atlantic and Gulf coasts. This fund should be provided for in the item of the appropriation bill entitled "Party expenses, Atlantic coast."

The following statements show the amount of precise leveling and primary triangulation needed in the interior of Alaska.

TRIANGULATION NEEDED IN ALASKA.

	Miles.
Norton Sound to Eagle, via Yukon River.....	750
Yukon River to Kuskokwim Bay.....	350
Upper part of Kuskokwim River.....	250
Across Alaskan Peninsula, Cook Inlet to Bristol Bay.....	180
Susitna River, Cook Inlet to Fairbanks.....	300
Cordova to Tanana, along Copper and Tanana Rivers.....	700
From Copper River to One hundred and forty-first meridian.....	100
Total.....	2, 570

PRECISE LEVELING NEEDED IN ALASKA.

Norton Sound to Eagle, via Yukon River.....	800
Yukon River to Kuskokwim Bay.....	400
Upper part of Kuskokwim River.....	300
Susitna River, Cook Inlet to Fairbanks.....	325
Cordova to Tanana, along the Copper and Tanana Rivers.....	750
Copper River to One hundred and forty-first meridian.....	110
Total.....	2, 685

Launches for Inshore Work and Wire Drag.

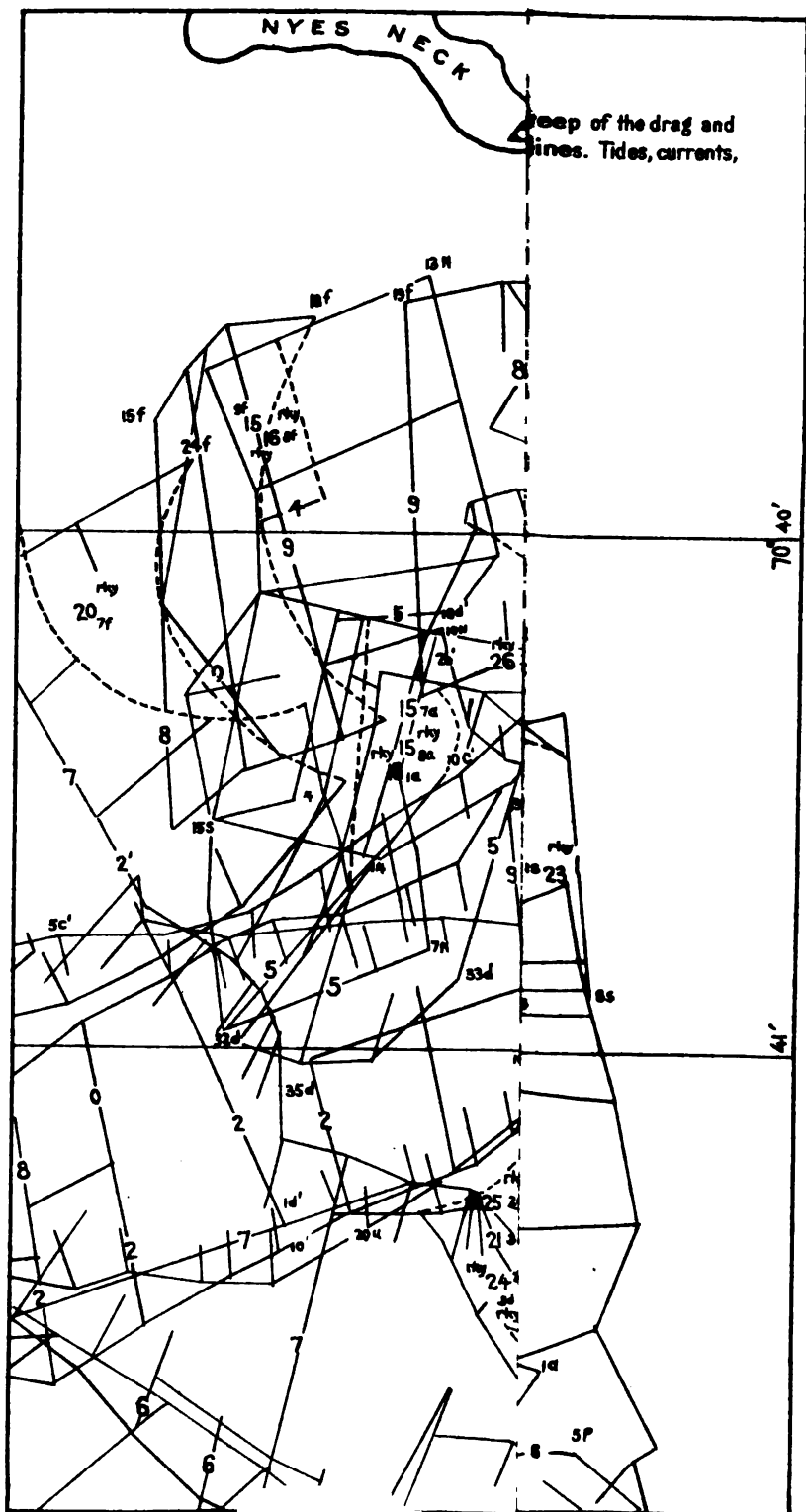
A vessel for offshore hydrography, which is mapping the bottom of the sea, must be of an ocean-going type, but a vessel for the inshore, and particularly for inside hydrography, should be a smaller craft. The custom has been to provide surveying vessels intended to be used for all kinds of work, with the result of giving the Survey small ships, too large for the inshore work, too small for the offshore work. Our present surveying ships, while at inshore duty, anchor in protected waters and the surveys are made by launches and boats frequently too small for the purpose, while the mother vessel is too large. On offshore work, the ship, being too small for safe ocean navigation, has to wait for good weather in order to run outside, and must drop her work and seek safety when it storms.

The *Iris* and *Bache* do useful offshore work on the Atlantic coast. The *Pathfinder*, in the Philippines, and the new *Surveyor* are the only other vessels of the Coast Survey large and stanch enough for offshore duty. None of them is small enough for economical work inshore. To use them for such work would be like using the crowbar for a toothpick. For wire-drag work neither these ships nor their launches are suitable, and therefore the custom has grown up of hiring at a comparatively high cost the large launches needed for the wire drags. Common sense requires that this unbusinesslike condition be remedied by providing small vessels and launches of such types as the work requires.

A very large proportion of the hydrographic work has to be done close to shore or in protected waters. For this service "one-party vessels," with a total force of 10 men, are more economical than to use a larger steamer. The Survey has now two such vessels in Alaska. Six are required for the necessary work on the Atlantic and Gulf coasts and as many more on the Pacific coast and in Alaska. It is intended to construct one or more of these vessels from the funds that will be asked from Congress for launches.

This fund of \$100,000 can be invested in launches for wire-drag work at a 7 per cent return to the Government. In other words, if so expended it would save the Government an annual expenditure now incurred of \$17,436. The present outlay for hire of launches would pay for the launches in a comparatively few years. But apart from this, no launches can be hired which are designed for the special work they have to do. The proposed appropriation, therefore, would mean that more work would be done and better done than can be done to

it would actually cost less



than it now does. It is a waste of money to charter a boat unsuited for the purpose at a high cost to do the work of a wire-drag party, the expense of which in service is from \$200 to \$300 per working day, when a vessel can be built designed for the special work which will cost less and do more.

The accompanying section of a wire-drag field sheet shows the intricate nature of the work in the field as well as the plotting of it in the office. The area illustrated has been covered by wire-drag survey, the drag being drawn by the power boats mentioned above. The sweep of the drag and the course it took can be followed on the diagram by observing the many series of parallel lines. The tides, currents, and the action of the wind make it impossible to systematically cover the entire area by a straight parallel course.

Through the wise action of Congress there were in operation during the current fiscal year four wire-drag parties, two in Alaska and two on the Atlantic coast. This is double the number that have ever been before. They have achieved great, not to say startling, results. The average cost for each party is about \$20,000 for the six or eight months' season in which they can work out-of-doors, a total of \$80,000 for the combined operations. This work is immediately and practically productive. The increasing demands for new hydrographic surveys due to the increased size, draft, and speed of ships, and the development of submersible ships of war, together with the constant changes in depth and in form of bottom arising from the movements of sand on our Atlantic shores, call for the constant making of new surveys and resurveys of the most vital importance to the country. In this work the part played by the wire-drag parties is of great and immediate importance. Its cost per working day during the past fiscal year has been as follows, the different parties being distinguished by the name of the officer in charge:

Officer in charge.	Locality.	Date.	Cost per day.
	Atlantic coast:		
Hack.....	Portland.....	June-September, 1914.....	\$133
	Buzzards Bay.....	October-November, 1914..	813
	Key West.....	January-March, 1915...	293
	Boston.....	May-August, 1915.....	187
Hawley.....	Buzzards Bay.....	June-September, 1914...	200
	Cape Cod Bay.....	May-August, 1915.....	194
Colbert.....	Southeast Alaska.....	May-August, 1915.....	318
Daniels.....	do.....	July-October, 1914.....	413
		May-August, 1915.....	

The differences in cost in the above table are due to two principal causes:

1. The initial cost includes the first cost of the outfit, a part of which is available for subsequent work.
2. Some variation is due to weather conditions, which affect the number of days available for work.

The use of the wire drag has revolutionized hydrographic surveying. It has long been known that sounding with the lead line was not an infallible means of detecting submerged dangers. This is emphasized by the large number of such dangers which have become known and are shown on the charts only as the result of wrecks that have occurred upon them. It has not been so well known, and only the development of the wire-drag work within a recent period has made it clear, that a large number of submerged dangers may and do exist in much-frequented waters, being unknown and unsuspected merely because by chance no vessel of considerable draft has happened to pass immediately over them. This is, of course, especially true on our rocky shores.

During the past summer several such dangers have been discovered in the waters, many times surveyed, of Massachusetts Bay, and unpleasantly near the port of Boston. One rock with 25 feet of water over it was found where 51 feet were shown by soundings. Another with 21 feet over it was found where 41 feet were shown. A 15-foot boulder was found not far from Scituate lying between soundings of 26 feet and 28½ feet, which were the least depths indicated in the vicinity. Dangerous, unknown rocks were discovered by the wire drag in the channel leading from the East River into Long Island Sound, but a short distance from New York City and in one of our most frequented waterways.

In Alaska in a short season of three months 21 uncharted submerged rocks, constituting serious dangers to navigation, were discovered in 42 miles of channel. The existence of these had never been suspected. Recently a pinnacle rock with but 15 feet of water over it, of which there was no indication on the published charts, was struck by a vessel in the middle of Whale Passage. It was necessary to issue in August, 1915, a new print of the chart of Boston Harbor showing the changes developed by the use of the wire drag off that port during the summer of 1915.

It is interesting to know that this work has so far developed that in the summer just past drags have been used that are 24,000 feet



PINNACLE ROCKS ON THE ALASKAN COAST.

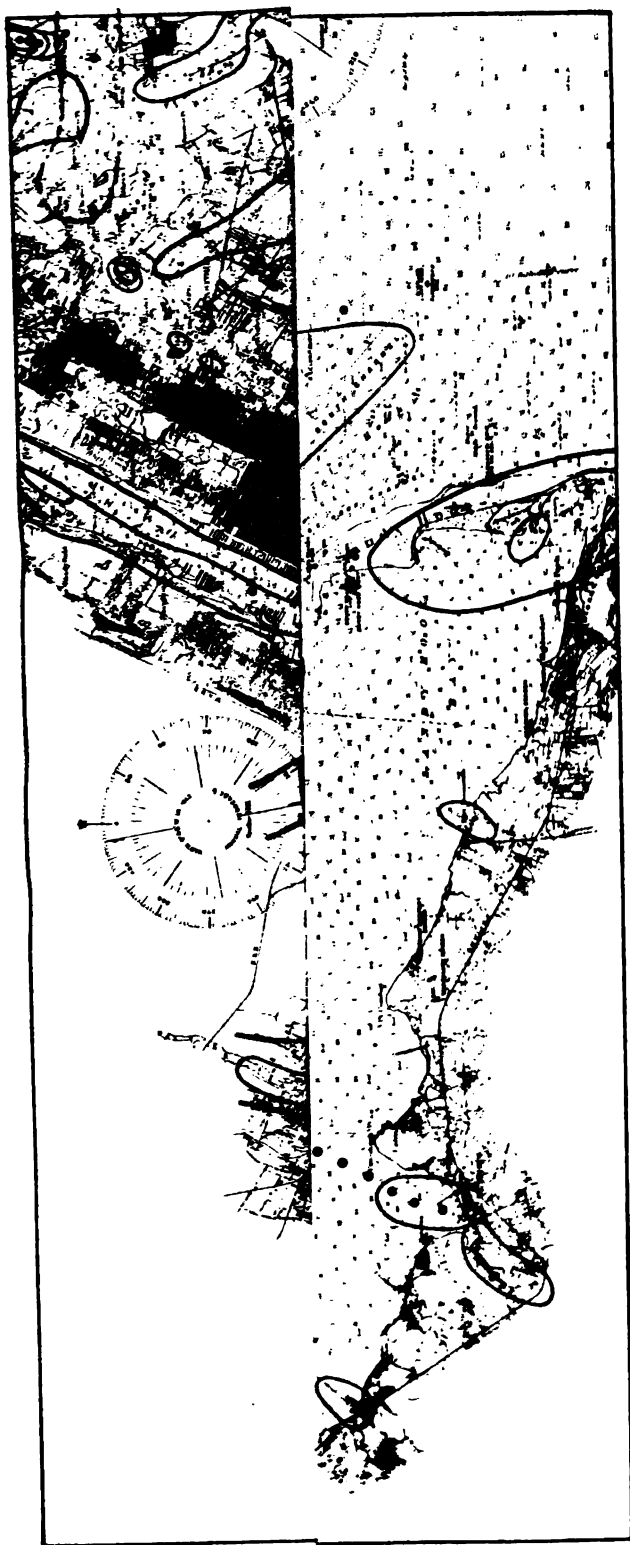
The growth of the work is shown by the fact that in 1910 the services of 1.7 draftsmen, working continuously every working day in the year, were necessary to keep up. In 1911 this work required 2.5 draftsmen. During 1915, 4.7 draftsmen were engaged, and were not enough.

The accompanying illustration will explain what is meant above by the phrase "putting new results in final form for publication." It shows the chart of New York Harbor, reduced in size, and indicates the number of changes which accumulated during a single year on this chart and the sources from which they came. These different sources and the locations on the chart to which they apply are indicated by the different colors. There were 11 corrections arising from original field sheets showing the work of the Coast and Geodetic Survey itself. There were 65 arising from blue prints indicating the work of the Army engineers. There were 125 from city maps which had to be noted, and there were 52 light and buoy corrections arising from the operations of the Lighthouse Service. Thus on the chart of this one harbor in a single year 253 changes were required, and the time necessary for compiling, drawing, and engraving them was 233 working days.

Men are necessary to reconstruct the charts of southeast Alaska. The present charts were compiled before the triangulation was adjusted and each reported danger or new aid placed brings to light serious discrepancies.

The men in the printing section are underpaid. Their wages are not in accordance with those paid for similar work in other departments of the Government and in commercial houses. The force in the printing section has not been increased in proportion to the output of charts, and the facilities are not adequate for turning out the work promptly.

The clerical force is conspicuously inadequate. The Superintendent has neither clerk nor stenographer. The need of a clerical assistant to act in the capacity of a secretary and stenographer to the Superintendent is a matter that I recommend for immediate consideration. At the present time the Superintendent is greatly handicapped, owing to the fact that he has to call for assistance from those who are rendering customary services to other officials in the same Bureau, and further, owing to the inadequate clerical force, the Department has been appealed to during the last six months, and has at various times supplied a stenographer. It is



Corrections which have accumulated in
a year to keep this chart up to date.

11 Original field sheets	125 City Maps
65 Blueprints, U.S. Engineers	52 Light and Buoy corrections

earnestly recommended that a secretary to the Superintendent be provided in the urgent deficiency bill at a salary of \$1,800 per annum.

In some divisions it has been found that work has seriously accumulated from the fact that there was not sufficient stenographic help. The Superintendent has appealed to the Department at large for assistance in this respect, and though such has been furnished as far as was possible it has not been sufficient to keep up with the work.

Bureau Printing Facilities.

The results of our surveys reach the navigator and the engineer in the form of charts. Large sums and much labor are spent in collecting and arranging the material for these charts. It is essential that the charts shall show the results of this work in the most perfect form. The final stage in making the chart is the printing of it, and the best press known should be employed to maintain this work at the highest standard. There should be enough presses to make it possible to meet urgent demands promptly. The chart must be distinct and the colors on it must register; that is, they must fit exactly in their assigned places. A very slight fault, hardly noticeable to the layman, in this respect may well mean the loss of a vessel. Where chart paper for printing has to lie for lack of a press for an interval between the several printings it requires it contracts or expands, and this means faulty register. Faulty register means that a buoy may be shown out of its true place.

With the single press the Service now has this rapid sequence in printing is impossible because of the time necessary to clean up the press to change the color. After the first black printing the press must be cleaned to put on the red color to print the buoys, and after this is done the press must again be cleaned before putting on the tint color. Each cleaning means at least an hour's loss of time while the press lies idle and while the paper shrinks.

Modern presses are made which prevent this loss. I therefore urge the provision by Congress of a two-color, offset press, by means of which the two most important impressions required on our charts can be done at one printing and with much greater accuracy than is at present possible. This will also permit a reduction in the cost of paper used by omitting the high finish which the use of the present press requires that the paper shall

have. Reference is made to a letter dated April 20, 1915, from the Director of the Bureau of Standards as follows:

DEPARTMENT OF COMMERCE,
BUREAU OF STANDARDS,
Washington, April 20, 1915.

The SECRETARY OF COMMERCE,
Washington, D. C.

DEAR SIR: Answering your letter of April 12, relative to facts bearing on the advisability of using an offset press for printing nautical charts at the Coast and Geodetic Survey, you are advised as follows:

Chart paper of the quality required by the Coast and Geodetic Survey in order to meet the conditions for both copper plate and flat-bed lithograph printing is considered by the paper industry as a paper belonging to a special class having a very restricted demand. Such papers are, therefore, trade specialties, and the experience of this Bureau has clearly shown that even the high-grade mills can not make a satisfactory sheet of chart papers without first making experimental runs, entailing an extra cost to the Government.

The offset press is rapidly superseding the old-style flat-bed lithograph press, and for this reason many mills that formerly produced sized and supercalendered papers for the flat-bed lithograph press are now equipping their mills to manufacture what is known in the trade as offset papers. Chart papers are very little known in the paper trade, whereas offset papers, together with the requirements necessary to produce suitable papers, are receiving a large amount of attention by the paper trade at this time.

Offset papers made from all-chemical wood to all-rag stock are carried in stock by the paper trade at prices ranging from 6 cents to 14 cents per pound, and it is the belief of this Bureau that a suitable paper could be secured by the Coast and Geodetic Survey at a price not to exceed 12 cents to 14 cents. It is the belief of this Bureau that if the Hydrographic Office of the Navy Department would purchase its chart paper in conjunction with the Coast and Geodetic Survey, thereby enabling the mill to make a full run at one time, would result in a lowering of the price to the Government on the special sizes required for chart printing. There may be other bureaus that could also combine with the above in their purchase.

The Bureau desires to call your attention to one point: The offset press so far has not given entire satisfaction on small-scale charts having great detail, or for charts required to show a mass of rock and harbor detail, as the fine detail lines are not as sharp and clear from offset printing as they are when printed from engraved copper plates. For this reason it may always be necessary to have some copper-plate printing, though the number of such charts is relatively very small as compared with the bulk of the charts printed.

You, of course, appreciate the fact that copper-plate printing requires that the paper must be thoroughly moistened with water before printing. This dampening of the paper causes more or less buckling or wrinkling, and distortion is liable to occur while the paper is being printed. The offset press entirely overcomes this trouble, as the paper is printed dry and, moreover, the offset press will show excellent results on papers that have far too rough a surface for either flat-bed lithograph or copper-plate printing.

Respectfully,

S. W. STRATTON, *Director*.

It is recommended that the force employed in the Coast Pilot section be reorganized by making them assistants and that the number of assistants be correspondingly increased with a similar decrease

in the appropriation for offshore soundings, from which appropriation the salaries are now paid. This will add to the efficiency of the service by rendering the ability of the nautical experts in the Coast Pilot section available for all branches of the Survey's work, instead of confining it as now to strictly Coast Pilot work. It will give an opportunity to the younger members of the field force assigned to the Coast Pilot work to learn the work of the Service in other divisions, will eliminate the lump-sum salaries, and provide greater flexibility in the Service generally.

International Geodetic Association.

Congress has for two years failed to appropriate funds for the contribution of this country to the International Geodetic Association. The United States entered into an agreement with other nations under which we are obliged to make our annual contribution to this work. The following letter shows that the United States agreed to continue in the International Geodetic Association for a period of ten years from December 31, 1906:

EMBASSY OF THE UNITED STATES OF AMERICA,
Berlin, November 9, 1905.

M. No. 8004.

The undersigned, ambassador of the United States of America at Berlin, has the honor to inform Monsieur van de Sande Bakhuyzen, permanent secretary of the International Geodetic Association, that the Government of the United States approves of the proposition to continue for a period of ten years after the 31st of December, 1906, without modification, the agreement under which the International Geodetic Association is operating and which will expire at that date.

The undersigned ambassador avails himself of this opportunity to express to Monsieur van de Sande Bakhuyzen the assurance of his distinguished consideration.

CHARLEMAGNE TOWER.

MONSIEUR VAN DE SANDE BAKHUYZEN,
*Permanent Secretary of the International Geodetic Association,
Observatory of Leyden, Holland.*

The agreement referred to in the letter of Mr. Tower will expire at the end of the calendar year 1916.

In view of the above it is believed that the United States is still a member of the International Geodetic Association, and it is recommended not only that this country be represented by a member of the permanent commission, but that sufficient funds be made available by Congress to meet the contributions covering the past two years as well as for the next fiscal year.

The important international latitude observatory at Ukiah, Cal., should not be abandoned. The board of directors of the Astronomical Society of the Pacific, feeling that the European war might make it necessary for the International Geodetic Association

to abandon its work at the variation of latitude observatories, passed the following resolutions at the meeting on November 30, 1914:

Whereas, it has come to the attention of this board that the work of the international latitude observatories is threatened by the present war in Europe, and that some of the stations may be closed: *Be it*

Resolved, That it is the sense of the Astronomical Society of the Pacific that the work of these stations is of the greatest importance, and that every effort should be made to continue the stations in this country even though others are necessarily closed.

Resolved, That the president and secretary of this society be authorized and instructed to present the views of this society to the proper authorities of the United States Government and urge upon them the desirability of making some special provision for the maintenance of the stations in this country.

The estimates for the Coast and Geodetic Survey for the year 1917 contain a provision for the expenditure of such funds as may be necessary, up to \$2,500, for the maintenance of the observatory at Ukiah, Cal., if the International Geodetic Association is not able to continue this observatory in operation on account of the lack of funds or for any other reason while the European war is going on. It should be understood that after the war is over the association should resume the observations at the Ukiah Observatory as soon as practicable.

Suboffices.

The Coast and Geodetic Survey has now suboffices at Manila, Seattle, New York, San Francisco, Galveston, Boston, and New Orleans. The Galveston office was started in May of this year, through the interest of the chamber of commerce there, which placed at the disposal of our inspector office room and a clerk, having the understanding that an effort would be made to secure the necessary funds next year to maintain this office.

The Boston and New Orleans offices are conducted in cooperation with the Bureau of Foreign and Domestic Commerce, and are in the charge of officers of that Bureau, who have files of Survey publications and charts for the information of those interested who may call to consult them. The suboffices at San Francisco, Seattle, New York, and Galveston have only one officer of the Survey at each.

The Seattle suboffice is found to be useful to the Washington office in securing information and otherwise assisting in carrying on the routine business in connection with the surveys of Oregon, Washington, and Alaska. It becomes more evident each year with the increase of commercial activities along the coast of Alaska that this suboffice can not give adequate attention to such a large ter-

ritory. Therefore the need may arise of a suboffice in Alaska at a suitable point, such as Juneau.

On the Atlantic coast, in addition to the suboffices that we are now trying to maintain, it would be helpful to have a suboffice at Norfolk.

These offices are proving very useful to the maritime public and others in their localities by enabling them to obtain information immediately and directly. Owing to the lack of funds, these officers are restricted in their activities to office routine almost exclusively. Funds are needed to provide each of these offices with a clerk in addition to the officer in charge, so that the clerk could keep the office open and enable the officer in charge to keep in touch with the inspection of the coasts in his district and make reports to the Washington office of any errors in the existing charts, the need for revision surveys, and any information of benefit to the maritime public and of use in keeping our charts revised up to date.

It would be of invaluable assistance to the Survey in keeping its charts up to date if the coasts could be divided up into inspection districts (like those of the Lighthouse Bureau and the Coast Guard) with an officer conveniently located in each, whose duty it would be to constantly inspect the coasts in his district and report to the Washington office, with recommendations, any errors, changes, etc., affecting the accuracy of the charts.

Proposed Purchase of Dutch Harbor, Aleutian Islands, Alaska, as a Federal Government Base.

A serious problem confronts the Government in reference to a supply base in western Alaska for coal, oil, and other ship supplies. At the present time Unalaska is the headquarters of the Coast Guard cutters and acts as a supply base for Government vessels; but the arrangement is not ideal, for several reasons.

First, the harbor is poor. The only means of reaching the wharf is through a narrow and crooked channel, which is dangerous to a vessel of ordinary size. Second, at this place the Federal Government has paid many thousands of dollars to a private company for coal transported from Australia, Canada, and the United States, besides incurring other annual expenses in payment of various privileges received. As it is necessary for Government vessels to dock at a private wharf, and to accept courtesies in connection therewith, it thereby places them more or less under obligation to a private concern. Third, there is a poor fresh-water supply at Unalaska, and the buildings are inadequate.

In view of the fact that commerce has greatly increased in this section of Alaska, it is quite necessary and natural to look for a *permanent* supply base. Upon investigation it would seem that Dutch Harbor, the abandoned village and home of the North American Commercial Co., is the logical place for the Federal Government to own. The only wireless station in this section is located close to this deserted village, making it easy of communication; the harbor is excellent, with ample room for sufficient wharves; and there is a liberal fresh-water supply. The buildings of this company are in *more* than a fair state of preservation, and besides the good buildings there are coal yards with trackage for hauling coal, scales, derrick, and practical storage bins, already built. As has been stated, the entire village is deserted and can be acquired as a whole. Considering all this, it would be highly advisable for the Government to negotiate at an early date for the purchase of this settlement.

The Department of Commerce would be greatly helped by having such a permanent Government station in this isolated section of Alaska. This Department is carrying on important work in that region at the present time, and the natural expectation is that it will do much more each year. It is necessary for our vessels to have a place where they may readily and cheaply secure their coal, which has not been the case heretofore; the new vessel of the Coast and Geodetic Survey, which will probably do much work in this territory, is an oil burner, and could be supplied with her fuel from Government tanks, and not from those of a private company.

The Bureau of Fisheries, with its great interests, is custodian of the Pribilof Islands; its vessels will ply back and forth from the islands to eastern Alaska, as well as to Seattle, and this will make this point a valuable one from which to replenish fuel and other supplies.

The Lighthouse Bureau will also be greatly benefited because of its tenders being in that region at intervals while carrying on their specific work.

One of the most important features is that the Coast Guard, which have made their headquarters at Unalaska in the past, and which have for some time earnestly recommended the purchase of this property, will feel the benefits to a great extent.

There are thousands of tons of fuel used by all the Government vessels in that section, which, at present, are purchased from private concerns at large figures; while if the Government owned

its own supply base this same fuel could be furnished from Government bins and tanks, brought there from Government-owned mines and oil wells on Government vessels and colliers. In this way the cost of the purchase of this property would soon be realized in the saving on these supplies. It is earnestly hoped that the coming Congress will act favorably on this recommendation.

General Summary of Field Operations—Vessels and Parties.

Atlantic coast.—The steamer *Bache* was employed on offshore hydrography off the coasts of South Carolina, Georgia, and Florida. This work, much of which was out of sight of land, was done with an accuracy never before attempted in this class of work, and yet due to improved methods the cost of the work is less than that heretofore done by this vessel. These surveys are a permanent addition to an accurate knowledge of our coasts.

The steamer *Endeavor* was engaged on the hydrographic resurvey of Delaware Bay Entrance. This vessel was condemned November 11, 1914, as unfit for further use and sold under sealed proposals to the highest bidder, May 12, for \$1,015.50.

The steamer *Hydrographer* was employed in supplementing the hydrographic surveys of Long Island Sound between Execution Rocks and Norwalk Islands, including Oyster Bay. Many dangers to navigation were discovered. Afterwards the *Hydrographer* was engaged on resurveys in Albemarle Sound, N. C., and in the vicinity of Sandy Hook, N. J.

The steamer *Isis* was chartered May 2, in anticipation of her purchase by the Survey July 1, at which time the funds became available. Plans were prepared to fit her for surveying work.

The schooner *Matchless* completed revision work in certain places in Chesapeake Bay and began a general resurvey of Albemarle and Croatan Sounds, N. C.

Chart revision work has been done in Passaic and Hackensack Rivers, N. J., and a resurvey of Arthur Kill begun.

A resurvey was made of Great South Bay, Long Island, and a topographic and hydrographic survey of Jamaica Bay was completed. Signals for hydrography were erected on the coast of New Jersey. The survey of the water front of Philadelphia was revised. At the request of the Bureau of Fisheries a triangulation was made in St. Vincent, Fla.

Field revision work for correction of the Atlantic Coast Pilot was done in Chesapeake and Delaware Bays; in the inland waters

on the coast of New Jersey; from Point Judith to New York and up the Hudson River; on the south shore of Long Island; in the approaches to the Cape Cod Canal; and on the Gulf of Mexico from Key West to the Rio Grande.

Physical hydrography in the Potomac River, undertaken at the request of the Public Health Service, was completed.

A revision was made of the chart of Salem Harbor, Mass.

Inspection duty for the region between Narragansett and Delaware Bays was continued by an officer of the Survey with headquarters in New York City. An inspector for the Gulf coast was appointed with headquarters at Galveston, Tex.

A stock of publications, including charts, of the Survey will hereafter be kept at all suboffices and on the vessels of the Survey and on certain of the vessels of the Bureau of Lighthouses and Bureau of Fisheries.

Pacific coast.—The steamer *Explorer* completed the survey of Knik Arm, Alaska, and made an examination at the mouth of Woodrow Creek for the Alaskan Engineering Commission.

Afterwards the *Explorer* made surveys and examinations in Seldovia Bay; north of Montague Island and between Hinchinbrook and Smith Islands; between Perry and Lone Islands and on the bar between Culross and Esther Islands. An examination was made of the edge of a flat off Sheep Creek. In the spring wire-drag work was done in Richs Passage, Wash.

The steamer *Gedney* made surveys in the waters west of Prince of Wales Island, including Klawak Inlet, Tonowek Bay, Trocadero Bay, Meares Passage, and Sukkwan Strait. An improvised wire drag was used in some localities. The survey of the main ship channels on the west side of Prince of Wales Island and of a safe inside channel from Tonowek Bay to Sea Otter Sound was completed.

The steamer *McArthur* was engaged in general surveys in Nichols Passage and Felice Strait. A wire drag was used in some localities to supplement the soundings. The survey was carried through Nichols Passage and into the northern part of Felice Strait. A search was made for a reported shoal in Portland Canal. In the spring revision work was done in Richs Passage, Wash.

The steamer *Patterson* was engaged in general surveys in the Shumagin Islands and adjacent mainland of Alaska. Sounding lines were run between the islands and Unimak Pass and in the locality of the reported Lenard Rock and elsewhere. A bank off Cape Sarichef was developed. The triangulation was extended

from the Shumagin Islands to Kuiu Bay and a hydrographic reconnaissance was made of the same area.

In September and October the *Patterson* made a voyage of 1,700 miles to the assistance of the revenue steamer *Tahoma*, wrecked on an uncharted reef in the western Aleutians. Twenty-nine of the officers and crew were picked up and brought back to Unalaska.

In returning to the field of work in Alaska in the spring a rock in Whale Passage was located by the *Patterson*.

The steamer *Taku* completed the hydrography and topography of Passage Canal and Landlocked Bay, and the triangulation of Landlocked and Fidalgo Bays. In the winter revision work in the vicinity of Seattle, Wash., was done by the chief of this party.

A party extended a triangulation across the (Alaska Peninsula) glacier between Passage Canal and Turnagain Arm, which connects the triangulation systems of Cook Inlet and Prince William Sound.

Work was resumed in June, 1915, in Ports Gravina and Fidalgo.

The steamer *Yukon* discovered and charted a good channel from Kuskokwim Bay through the extensive flats into the Kuskokwim River. This opens up an extensive region in Alaska which was previously quite inaccessible and the transportation charges so high as to practically prohibit development. The survey of the Kuskokwim was resumed in June, 1915.

Wire-drag work in Tongass Narrows, Alaska, was begun in July, 1914. This work required some preliminary triangulation and topography. Wharves were located at Ketchikan and corrections made to the shore line of Revillagigedo Channel. Drag work was done in Tongass Narrows, Nichols Passage, Port Chester, and Revillagigedo Channel. Work was resumed in May, 1915. In 1914, 21 dangers were reported, of which 11 were of the first importance. In May and June, 1915, several dangerous rocks were discovered.

In May, 1915, a second wire-drag party began work in Sumner Strait, Alaska, in the vicinity of Bluff Island. By June 30 drag work had been carried northward nearly to Point Baker. Drag work was done on the eastern side of the strait, including Calder Rocks. Triangulation and topography were done for control of the drag work.

A resurvey of Yaquina Bay, Oreg., was completed.

Current observations were begun with the cooperation of the Bureau of Lighthouses at five light vessels on the Pacific coast.

Inspection duty for the coast of California has been continued by an officer of the Survey, with headquarters at San Francisco, and for the coasts of Alaska, Oregon, and Washington by an officer with headquarters at Seattle.

Hawaii.—In the Hawaiian Islands the revision of the triangulation and topography of the island of Hawaii was completed, and that of the island of Moloai begun.

Philippine Islands.—The field work in the Philippine Islands is under the immediate direction of the director of coast surveys at Manila.

The steamer *Fathomer* has operated chiefly in the area between the islands of Panay, Cuyos, Mindoro, and Calamianes. Combined operations were carried on in this region, but the hydrography was the principal work.

The steamer *Marinduque* made general surveys in the vicinity of Palawan Island and the Calamianes Group.

The steamer *Pathfinder* was engaged in general surveys in the southwest and east coasts of Mindanao, in the Sulu Sea, and in San Bernardino Strait. A special survey was made of Palmas Island.

The steamer *Research* continued general surveys in Ticao Pass and vicinity on the coast of Panay, and on the west coast of Luzon and eastward of Delian Island, including Magallanes Bank.

The steamer *Romblon* was at work in the same general region as the *Fathomer* and *Marinduque* and more particularly around Linapacan and Culion Islands and between Palawan and the islands offshore to the eastward.

Geodetic work.—The triangulation between Memphis, Tenn., and Huntsville, Ala., begun during the previous year, was completed. The erection of signals and station marking on this arc had previously been done by a separate party.

After this work was done a reconnoissance was made to connect the triangulation in the vicinity of Louisville, Ky., with the transcontinental arc in the vicinity of North Vernon, Ind. Signals were erected and stations marked for this work, and the observation of angles was then begun and carried to completion.

Reconnoissance for primary triangulation and preparation of stations for the observing party in Idaho were begun in May, 1915, and were in progress at the close of the fiscal year. The observation of angles on this work was begun in the latter part of June. Automobile trucks were used for transportation both of the recon-

noissance and observing parties. This triangulation was undertaken at the request of the U. S. Geological Survey.

The arc of secondary triangulation extending from Juan de Fuca Strait to Grays Harbor, a distance of 110 miles, was completed during the year. This was a work of great difficulty, owing to the absence of trails and the densely wooded character of the country. It was necessary to elevate the theodolites, heliotropes, and lamps above the timber, many of the instrument stands being more than 100 feet high.

Precise leveling was done on a line extending from Butte, Mont., to Pasco, Wash., by way of Spokane, and also a short line from Sand Point, Idaho, to the Canadian boundary.

In the spring of 1915 a line of precise levels was run from Seattle to Blaine, Wash., to connect with bench marks of the Canadian Geodetic Survey. Work was begun on a line from Huntley, Mont., to a point on the Great Northern Railway in the vicinity of Mondak, Mont. At Louisville, Ky., a line of levels was run connecting a station in the triangulation with a bench mark in the line of precise levels.

A line of precise levels was run between Minot, N. Dak., and Devon, Mont., and work was begun on a line from Carson City to Las Vegas, Nev. The latter line was undertaken at the request of the U. S. Geological Survey.

Precise leveling was also done on a line between Perth Amboy and Sandy Hook, N. J.

The total amount of precise leveling done during the year was 980 miles.

Observations were made for the determination of the astronomic latitudes of a number of points along the Texas-California arc of primary triangulation, and the oblique boundary between Nevada and California. The rapid progress made in this work was due in a large measure to the use of an automobile truck for transportation of the party engaged in the work and its equipment.

A determination was made of the difference of longitude between Far Rockaway, N. Y.; the Naval Observatory, Washington, D. C.; and Cambridge, Mass. This work was done as a part of a plan to determine by cable the difference of longitude between Far Rockaway, N. Y., and Borkum, Germany. The cable determination was interrupted by the European war.

The differences of longitude were determined between old longitude stations and triangulation stations of the Memphis-Huntsville arc and of the Louisville connection.

Astronomic latitude was also observed at five stations, and azimuth was determined at five stations.

Determinations of the intensity of gravity were made at a number of stations in the eastern part of the United States.

Magnetic work.—The usual magnetic and seismographic observations were recorded during the year at the magnetic observatories of the Survey at Cheltenham, Md.; Tucson, Ariz.; Vieques, P. R.; Sitka, Alaska; and Honolulu, Hawaii.

Magnetic observations were made in the field at a large number of stations in the United States and meridian lines were established in many places. Observations were made at sea and on land by field parties of the Survey when practicable.

A large number of requests for information in regard to magnetic declination have been received and the information furnished.

Tides.—Tidal observations were made in connection with hydrographic surveys in the United States and its outlying territory and at regular tidal stations at Portland, Me.; Fort Hamilton, N. Y.; Atlantic City, N. J.; Philadelphia, Pa.; Baltimore, Md.; Key West, Fernandina, St. Augustine, and Cedar Keys, Fla.; Galveston, Tex.; San Diego and San Francisco, Cal.; Seattle, Wash.; and Juneau, Alaska. Tidal indicators exhibiting automatically the stage and height of the tides were maintained at Fort Hamilton and at New York City, N. Y., and Reedy Island, Delaware River.

With the cooperation of the Bureau of Lighthouses, observations of currents were made at a number of light vessels on the Atlantic and Pacific coasts. Similar observations were made when practicable by the hydrographic parties of the Survey.

International Boundaries.

Until April 15, 1915, the Superintendent of the Coast and Geodetic Survey was commissioner on the part of the United States for the survey and marking of the boundary line between the United States and Canada, and under authority of the State Department supervised the work of the boundary parties. After the resignation of the former Superintendent, a new boundary commissioner, not an officer of the Survey, was appointed. The Survey still cooperates with the work of the Boundary Commission in every way possible, but the officers engaged in that work no longer report to the Coast and Geodetic Survey, and consequently the annual report of the Superintendent contains abstracts only of the work done up to the time of the appointment of the new commissioner.

Parties were engaged during the summer season of 1914 as follows:

The numbering of the monuments on the boundary from the Continental Divide to the Lake of the Woods; the survey and monumenting of the boundary on Rainy Lake and Rainy River; the survey and monumenting of the boundary between the mouth of Pigeon River and Lake of the Woods; and the survey of the northeastern boundary in the vicinity of Halls Stream.

Assistance Rendered in Saving Life and Property.

In September and October, 1914, the steamer *Patterson* made a voyage of 1,700 miles and rescued a part of the officers and crew of the revenue steamer *Tahoma*, wrecked on a reef in the western Aleutian Islands.

In July, 1914, assistance was rendered by the steamer *Endeavor* to the lighthouse steamer *Iris*, with the Secretary of Commerce and other officials on board, which had gone aground during a sudden storm at Lewes, Del.

In February the officers and crew of the schooner *Matchless* rendered efficient service in extinguishing a fire on shore at Edenton, N. C.

In June, 1915, the steamer *Gedney* rendered assistance to the fishing schooner *Polaris* by hauling her off Klawak Reef, at the north end of Fish Egg Island, Alaska, on which she had run aground.

In May, 1915, the steamer *Pathfinder* assisted the schooner *Alpene*, of San Francisco, off the north end of Capul Island, San Bernardino Straits. The *Alpene* was towed to a safe position at sea.

The steamer *Explorer*, while at work at the entrance to Woodrow Creek, Alaska, rendered assistance to the steamer *Bertha*, which had been caught by a strong current while at anchor and was in danger of foundering.

Publications.

The primary object of the Coast and Geodetic Survey is the publication of charts for navigational purposes. Every other function, however important, is subordinated to that end.

No less important than the issue of new charts of localities which have been accurately surveyed for the first time is the prompt correction of the existing charts, as the result of natural or artificial changes.

Advance information in regard to newly surveyed regions is issued in the form of preliminary charts as soon as the results become available.

Improvements have been made of late years in the methods of chart printing and in the form and arrangement of the charts themselves.

The Mercator projection is being substituted for the polyconic projection on certain classes of charts. The new charts have their sides parallel or normal to the meridian and the details of the land are much simplified. The substitution of the foot for the fathom as the unit of soundings on large-scale charts of the Atlantic and Gulf coasts has been decided upon and meets with general approval.

The accommodations for chart printing have been improved by the erection of a new building and the extension and repair of the old building used for that purpose.

The geodetic and magnetic results of the Survey are issued in the form of special publications as rapidly as they can be prepared.

The geodetic and magnetic results are largely used by other bureaus of the Government, by civil engineers and surveyors, and by State and municipal authorities interested in works of development and improvement.

The Coast Pilot volumes, containing detailed descriptions of the coasts of the United States, with sailing directions for the navigable waters, are being constantly revised and corrected from the most recent information available. Inside-route pilots are issued for the use of the immense fleet of small craft navigating the shallower protected waters along our coasts.

Tide tables are issued, giving predictions for a year in advance of the state of the tide on each day of the year for all important localities on the coasts of the United States and at a number of foreign ports.

STEAMBOAT-INSPECTION SERVICE.

Personnel.

The force at the disposal of the Steamboat-Inspection Service is as follows:

At Washington, D. C.:

Supervising Inspector General.....	1
Chief clerk (who is Acting Supervising Inspector General in the absence of that officer).....	1
Clerks.....	7
Messenger.....	1

In the Service at large:

Supervising inspectors.....	10
Traveling inspector.....	1
Local inspectors of hulls.....	47
Local inspectors of boilers.....	47
Assistant inspectors of hulls.....	41
Assistant inspectors of boilers.....	42
Clerks to boards of local inspectors.....	69

Total.....	267
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Summary of Activities.

Two permanent positions (traveling inspector and one clerk in the office of the Supervising Inspector General) were added to the Service during the year. It will be noted that the Service comprises 10 persons in Washington and a field force of 257. This force inspected and certificated in the fiscal year 1915, 7,553 vessels, issued licenses to 18,412 officers of all grades, inspected at the mills 2,962 steel plates for the construction of marine boilers and a large amount of other boiler material, and examined 11,554 boilers; 5,022 applicants were examined for visual defects. Passengers to the number of 307,348,008 were carried on vessels which are required by law to report the number of passengers carried. The number of accidents resulting in the loss of life during the fiscal year was 190, and the number of lives lost was 368, including both passengers and crew—a decrease from the previous year of 214. Of the lives lost, 153 were from suicide, accidental drowning, and other causes beyond the power of the Service to prevent, leaving the loss of 215 lives as fairly chargeable to accidents, collisions, explosions, foundering, etc. The lives of 107 passengers were lost, which, compared with the number carried, shows a

ratio of 1 life lost for every 2,872,411 passengers carried. There was a decrease of 377 in the number of vessels inspected and a decrease of 2,247,471 tons in the tonnage of vessels inspected, compared with the previous fiscal year. This was chiefly because by reason of the war fewer foreign vessels were examined. There were certificated 5,946 domestic steamers and 321 foreign passenger steamers. There were inspected 28 sail vessels and barges, 565 seagoing barges, and 693 motor vessels. During the year there were examined and tested 161,335 life preservers. There were 3,120 reinspections of passenger and ferry steamers made by boards of local inspectors during the year, although for lack of money all reinspection work had to be stopped on June 10, during one of the heaviest months of navigation. This was particularly unfortunate, because reinspections are made without prior notice to the vessel and afford an invaluable means of supervision.

During the fiscal year 53 vessels were refused certificates of inspection, 271 boilers failed under hydrostatic pressure, 1,309 boilers were found defective from other causes, 75 boilers were condemned from further use, and a total of 25,206 defects in boilers and various attachments were discovered. A total of 295 licenses were suspended, revoked, or canceled; 341 licenses were refused. Seven hundred and ninety-four cases of alleged violations of the law were investigated. Full details of the Service in all its parts, and with reference to each inspection point in each of the 10 districts, will be found in the report of the Supervising Inspector General.

During the year the work of the traveling inspector, a new officer established during the fiscal year who began service on November 2, 1914, was of special value. This officer traveled over 11,000 miles, inspecting 253 vessels in use, and found and reported 247 deficiencies of various kinds, which are detailed on page 16 of the annual report of the Service.

Speaking generally, during the last fiscal year the Service inspected 271 fewer steam vessels, 116 more motor vessels, and 224 fewer foreign passenger vessels. There was an increase of 43,291 tons in the tonnage of seagoing barges inspected, an increase of 355 in the Government boilers inspected, and an increase of 75 in the total number of reinspections made, though this work was cut short for lack of money, as before stated.

Urgent Needs of the Service.

The Service is undermanned. It has an insufficient clerical force. The field force is at times seriously overworked. It has not the requisite technical staff, and the funds provided for its general expenses (contingent fund) are insufficient. It may be set down as a fact that a service of this kind can not do its work any better than the public allows it to do it. The public is supposed in this to speak through its lawful representatives. The needs of the Service have been most explicitly made clear. In my last annual report, page 180, I said:

It is useless to pass more exacting laws or for the Board of Supervising Inspectors to go into any greater detail in the matter of the Rules and Regulations until Congress shall have given the Steamboat-Inspection Service enough men to enforce the laws and carry out in an intelligent manner the rules that already exist. In some districts men are required to work from 5 o'clock in the morning until 10 or 11 o'clock at night. Such a condition is wrong. A great and powerful Government such as ours should certainly provide a sufficient number of inspectors to properly perform these duties. If disasters occur as a result of lack of thoroughness, the responsibility will not rest upon the Steamboat-Inspection Service. The importance of this matter should be clear to Congress, and, as already stated, it should not be necessary for a great disaster to occur before the necessary steps are taken to prevent further disaster.

I added:

Systems are of no effect, and organization amounts to nothing, if sufficient men are not furnished to properly operate the machinery. The Steamboat-Inspection Service is so organized as to be capable of indefinite expansion, but it is to-day up to the limit of its endurance. The cry of the Service is for more men, and unless more men are furnished the proper standard of inspection can not be maintained.

This I now reaffirm. The statement of last year bore little fruit. One additional clerk was allowed and one traveling inspector was permitted for the fiscal year 1915. Three assistant inspectors in New York were granted for the fiscal year 1916, instead of the six asked. That is all. It was not enough, and the overstrain went on and still continues.

Wishing to make the matter so plain to the public that no responsibility might in this respect rest upon the Department, the statement was made to the New York Maritime Exchange on December 3, 1914, of which quotation is made in the early pages of this report. The following was added:

The Service is undermanned; we need now six more assistant inspectors in New York, two more in Boston, others elsewhere. Let me be very practical. Do not criticize us for delay if after knowing we are short of men you do nothing to help us get them. Public opinion is the power that rightly governs legislatures and you can express it. In Buffalo and elsewhere our inspectors work often for long periods— from 7 a. m. to 10 p. m. continuously. I am calling on them always for more and better

asked but there is a limit to human powers. Unless we have more men here and elsewhere I give you definite warning that we must soon do less work or do it less well. Let it be done, before anything happens, I tell you plainly of it.

A statement showing the conditions in the harbor of Buffalo was filed with the Appropriations Committee on November 28, 1914, and appears on page 126 of the hearings on the legislative, executive, and judicial appropriation bill for 1916, Sixty-third Congress, third session. In that city, since there has been an increase in the force, the tonnage in the harbor has grown from 150,000 to 500,000. A similar condition prevails elsewhere. At that time I stated to the committee:

The Supervising Inspector General reported to me about a month ago that we had reached the limit of our rope, that we had gotten to the point where we must now choose between leaving our work so less well done or having a sufficient force to carry it on.

This condition has not improved but has become worse since the enforcement of the seamen's law has imposed upon the Service a very large amount of new work for doing which no provision whatever has been made. This new law has imposed 15 or more new duties on a force already overworked without any additional compensation or assistance.

The Steamboat-Inspection Service was charged during the past year with the protection of the lives of over 300,000,000 passengers, with the safety of the investment in over 7,500,000 tons of vessels, and in a measure with the security of the millions of tons of cargo these vessels carry. This is its task, but it is not fully equipped for that task, and the officer in charge of the Service is paid less than any of his associates, save one, occupying a similar post of responsibility. Our estimates will include a request that his salary be raised from \$4,000 to \$5,000.

Wide Limits of Certain Inspection Districts.

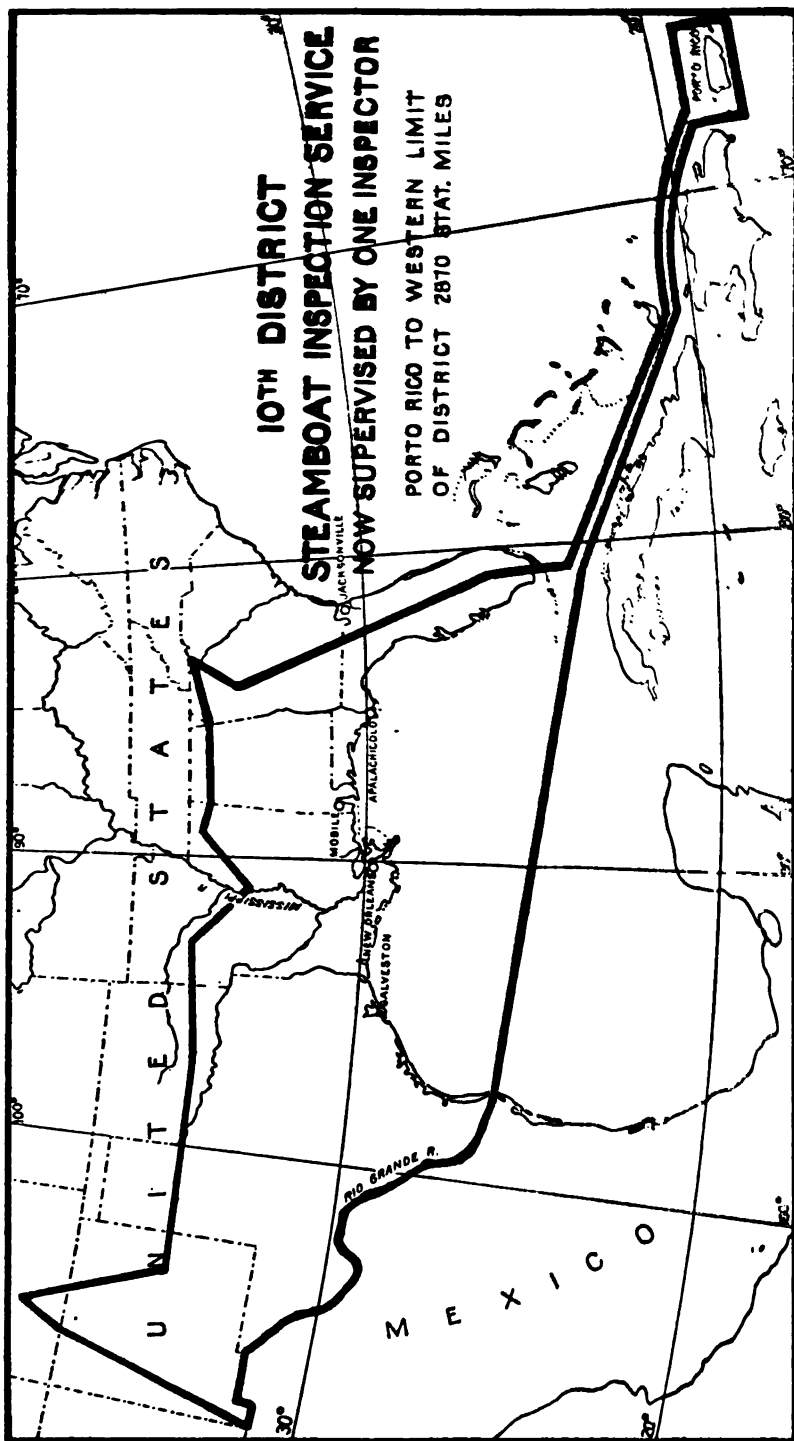
On behalf of shipowners and shippers and passengers alike, I protest against a continuance of these conditions. I protest against the absurdity of one supervising inspector on the Pacific coast being charged with the supervision of the coasts of California, Oregon, Washington, Alaska, and Hawaii, including the navigation on the Sacramento, Columbia, and Snake Rivers. (See chart on opposite page.) No man is competent for such a task, yet a request that this vast district be divided into two and another district be created at Seattle of the Steamboat-Inspection Service is to be made by the public for the work with which it is to be in fairness be

It is obviously impossible for the supervising inspector of the first district to carry out this law, for two reasons: First, because no human being could do it in a district reaching from Nome to San Diego and from Idaho to Hawaii; and second, because if such a fabulous person could be found funds are not provided sufficient to cover the necessary traveling expenses. It is only with less difficulty that the supervising inspector of the tenth district (see chart on opposite page) can carry out the requirements of the law in a district which reaches from western Texas to Porto Rico.

A bill will be introduced to divide the first district into two, the new district to consist of the local inspection districts of Seattle, Wash., Portland, Oreg., Juneau, Alaska, and St. Michael, Alaska, with the supervising inspector stationed at Seattle, Wash., and the balance of the old first district to include the local inspection districts of San Francisco, Cal., Los Angeles, Cal., and Honolulu, Hawaii, with the supervising inspector stationed at San Francisco.

The policy has been to impose the largest responsibility over what seems, in these two cases at least, the greatest possible area, and then to provide an insufficient clerical and inspecting force to do the work, meanwhile holding the Service to a searching accountability, which, however just it might be were the men and means sufficient for the work, is under existing conditions a grave injustice. The public simply know there are inspectors charged with certain duties. They do not know how the ability to perform those duties is limited by insufficient force and narrow funds. They can not, therefore, discriminate and their condemnation may unjustly fall, when accidents may occur, upon men who are doing all possible under adverse circumstances to protect the lives of the people of a great and powerful nation, which has not, however, provided means for doing the work with which it charges them.

The estimates of the Bureau have been trimmed to the bone by the Department itself before submitting them, but these have been still further cut when appropriations are made, with unfortunate results. The supervising inspectors are instructed that they must spend as much time as possible in the field carrying out specifically the express commands of the law, but this will mean that a considerable addition to the funds of the Service available for traveling must be provided.



Inquiry into the "Eastland" Disaster.

In the early part of this report I have referred to the *Eastland* disaster, which, while it did not occur until shortly after the close of the fiscal year, has nevertheless received so much public attention as to require mention here. A copy of my report to the President dated August 10, 1915, together with the statement unanimously made by the board of inquiry dated August 5, 1915, follows:

PITTSFIELD, MASS., *August 10, 1915.*

The PRESIDENT,

The White House, Washington, D. C.

SIR: The news of the disaster to the steamship *Eastland* reached me at Syracuse, N. Y., on the afternoon of Saturday, July 24. Hon. Edwin F. Sweet was in charge of the Department in Washington. George Uhler, Supervising Inspector General of the Steamboat-Inspection Service, had gone to the Pacific coast, and Mr. D. N. Hoover, jr., Deputy Supervising Inspector General, was in charge of the Service. Mr. Sweet left Washington for Syracuse Saturday evening and conferred with me on Sunday, 25th. Mr. Hoover was immediately ordered to Chicago, and arrived there Monday morning, 26th. Mr. Sweet returned to Washington Sunday night, 25th, and on the 26th sent Mr. A. L. Thurman, Solicitor of the Department, to Chicago, whither I proceeded myself on the 26th, both arriving on the morning of Tuesday, 27th. You were advised by telegram of my departure. I think it proper to make it a portion of this record that the above action was taken of my own initiative and without direction or instruction of any kind.

The Revised Statutes of the United States require that every steamboat accident causing loss of life or property shall be investigated by a local board of inspectors, and gives to such local board the powers of a United States court for summoning witnesses and administering oaths. This is a procedure which takes place automatically under the law; no one calls for the investigation; no one orders it. It is a procedure which is taking place frequently all over the country. In this case, because of the gravity of the occasion, I deemed it proper that it should be conducted under the supervision of the Solicitor of the Department and myself. I may add for the sake of the record that the Solicitor is an officer of the Department of Justice assigned as legal adviser of the Department of Commerce.

On arrival at Chicago we found that the vessel had been officially inspected and reinspected by the local board at Grand Haven, Mich., and that examination had been several times made of her life-saving equipment during the current year by the local inspectors at Chicago. Under these circumstances, it seemed wise to call upon the local board at Milwaukee to conduct the inquiry required by law, since they had had no part in any inspection of the vessel of any nature. In order that the inquiry might be distinguished as far as practicable under the law from a purely departmental proceeding, I ventured to ask the assistance of Mr. Marvin B. Pool, a well-known merchant of Chicago, and of Mr. Harry A. Wheeler, a banker of that city, to act as unofficial members of a board of inquiry. To them I desired to add a well-known labor leader, but was embarrassed in securing such by the fact that some, if not most, of those immediately concerned had expressed their views publicly in advance of the hearing. I did not think it fit to call as an unofficial member of the board of inquiry anyone whose opinion had been expressed beforehand. Receiving a suggestion from Lieutenant Governor Barratt O'Hara respecting the desirability of the presence on the board of inquiry of some representative of organized labor, in which I fully concurred, I asked the lieutenant governor himself to accept, which he very kindly did, and continued to act throughout the inquiry save for one day's

absence on official business, on which occasion he sent his father to take his place. Mr. Philip B. Fouke, from St. Louis, chairman of the committee on the Steamboat-Inspection Service of the Chamber of Commerce of the United States, also kindly accepted an invitation to be present and act as one of the unofficial members of the board. On Wednesday, the 28th inst., Supervising Inspector General George Uhler arrived in Chicago from San Francisco, and Mr. Hoover returned to Washington to take charge of the Service there. At a later period of the inquiry, Naval Constructor James L. Ackerson, United States Navy, was kindly sent by Secretary Daniels to assist me and also acted as an unofficial member of the board of inquiry, as did Mr. E. C. Gillette, superintendent of marine construction, United States Lighthouse Service, who came to Chicago at my request. The professional knowledge of both was of great service in the inquiry, and both were present during the consideration of the final statement made by the board.

The first hearing of the board of inquiry took place upon Thursday, July 29, in the court room of Judge Kohlsaat, which was kindly put at our disposal. At its very outset an invitation was extended to all who had any knowledge that would throw light upon the subject of the inquiry to make such facts known to the board. No one accepted this invitation. The proceedings of the board were public, and the State's attorney, the office of the corporation counsel, the public administrator, the Congressman from the district chiefly concerned, Judge Sabath, and others were invited to take part in the questioning of witnesses and availed themselves freely of this privilege. As a matter of fact, therefore, the witnesses were examined not only by representatives of the Department of Commerce and of the Department of Justice, but by officers representing the State of Illinois and the city of Chicago and Cook County, as well as by Congressman Sabath and others. This may be illustrated by the case of Inspector Reid, the only one of the inspectors conducting the official inspection of the vessel who came before us. He was examined first by myself, then by Mr. Thurman. He was then cross-examined by Mr. Sullivan, assistant State's attorney, by Judge O'Hara, who for that day took the place of his son, the lieutenant governor, by Congressman Sabath, by Mr. Stebbins representing the corporation counsel, and by Mr. James L. Bishop, the public administrator. He was, in addition, questioned by others upon the board of inquiry. The record will show, therefore, that this inspector was examined by an officer of the Department of Commerce, one of the Department of Justice, and was cross-examined searchingly by five persons, and questioned to some extent by others.

It is proper to state that only the most cordial relations existed from beginning to end between Mr. Thurman and myself upon the one hand, and the State's attorney, Mr. Hoyne, the Federal district attorney, Mr. Clyne, his honor Judge Landis, of the Federal district court, the office of the corporation counsel, of the public administrator, and all other State, county, city, and Federal officers. In particular, the collector of the port was most courteous and helpful throughout, and our consultation with the officers of the Department of Justice in the office of the Federal district attorney was constant and pleasant.

A complete stenographic record of the proceedings was kept on behalf of the board of inquiry itself, and another was taken on behalf of the office of the State's attorney. I appeared with Mr. Thurman and Supervising Inspector General Uhler before the coroner's jury, and General Uhler and I appeared before the State grand jury.

On my arrival at Chicago, I announced through the press that the officers of the Department of Commerce would aid in every possible way to throw light upon the cause of the disaster and upon its own Service and that it would welcome the assistance of others and would cooperate with any authorized authority to a like end. For this purpose, Local Inspectors Reid and Eckliff, who this year made the official inspection of the *Eastland*, were by my order summoned from Grand Haven, Mich., to Chicago. They were, upon their arrival, promptly arrested by the local authorities, who, however, extended to them all possible consideration until they were released

on a writ of habeas corpus by Justice Landis. It is proper, however, to add that on one occasion, being called for as witnesses, they were brought in irons into our public hearing, a proceeding which seemed unnecessarily harsh with officers of the United States who had as yet been granted no hearing, against whom no indictment existed, and over whose acts, performed in another State and upon a vessel navigating the navigable waters of the United States, the jurisdiction of the officers of the State of Illinois was open to question.

At my direction, the supervising inspector located at Cleveland, Ohio, Capt. Nils B. Nelson, was ordered to Chicago, because he had had the *Eastland* under his supervision for six years. He appeared before the board of inquiry and was summoned as a witness before the Federal grand jury also.

Upon the issuance by Justice Landis of the order directing that witnesses subpoenaed to appear before the Federal grand jury should not be examined in any other proceeding, and upon the issuance of subpoenas to a very large number of witnesses, including the captain, chief engineer, and other officers of the *Eastland*, it became evident that it would be impracticable for the board of inquiry to determine finally the question of the conduct of the licensed officers of the vessel or the inspectors of the Department until after the grand jury should have concluded its labors, and that the result would be necessarily affected by whatever the action of the grand jury might be. It seemed, however, important that the board of inquiry should continue its study as far as was practicable in order that it might, if possible, suggest such remedial changes in the law as would tend to prevent a recurrence of similar accidents hereafter. With this in view, and with the concurrence of Justice Landis, the hearing was continued until August 5, upon which date the board unanimously concurred in the statement which has already been furnished to you, and of which the original is on file in the Department of Commerce. A copy of same is attached.

It is proper to add that the following-named persons assisted in preparing this statement and unanimously concurred therein, but their names for obvious reasons were not signed thereto:

James L. Ackerson, naval constructor, United States Navy.

George Uhler, Supervising Inspector General, Steamboat-Inspection Service.

A. L. Thurman, Solicitor, Department of Commerce.

James F. Bishop, public administrator, Cook County.

E. C. Gillette, superintendent marine construction, United States Lighthouse Service.

William C. Redfield, Secretary of Commerce.

A copy of the testimony taken at the inquiry, together with the statement of the board, will be transmitted to each House of Congress at the opening of the coming session, and the substance of this report to you and of the statement of the board of inquiry will be made a portion of my forthcoming annual report, although occurring after the close of the fiscal year to which that report refers. I propose also to include in my estimate for the forthcoming fiscal year an amount sufficient to provide for the functions which the statement recommends should be exercised by the Department of Commerce. Instructions were given on the 6th inst. to the Steamboat-Inspection Service to take the necessary steps to carry into effect the additional rules and regulations suggested by the board of inquiry. Instructions have also been given to the Steamboat-Inspection Service to call together a special committee, consisting of supervising inspectors selected from the Atlantic, Pacific, and Gulf coasts, who shall, with the supervising inspectors upon the Lakes, promptly consider what can be done, within the present lawful scope of the Steamboat-Inspection Service, to improve its effectiveness.

I have given assurance that as soon as practicable in the fall a searching inquiry will be made into the whole administration of the Steamboat-Inspection Service under the supervision of representatives of the Navy Department and of the public,

so that there shall be no question of its impartial character. Steps to this end have already been taken, and I shall in due time confer with you as to the membership of a board to be selected for that purpose.

I beg to remain, yours, very truly,

WILLIAM C. REDFIELD, Secretary.

Hon. WILLIAM C. REDFIELD,

Secretary of Commerce.

In obedience to the order of the Federal Court of the Northern District of Illinois, Eastern Division, dated July 31, 1915, that no witnesses subpoenaed to appear before the Federal grand jury be examined in any other proceedings relating to the *Eastland* disaster, and in view of the fact that some of said witnesses are necessary before this investigation is concluded, adjournment is taken until after the Federal grand jury has submitted its report.

Not having completed our investigation, we are not prepared at this time to express an opinion as to who is to blame, nor what agencies contributed to the capsizing of the steamer *Eastland*.

From the evidence thus far submitted, however, we are prepared to make certain suggestions designed to further safeguard marine travel. Therefore, we earnestly urge that you transmit to the President and to the Congress of the United States the following preliminary recommendation for changes in existing laws governing the inspection of steam merchant vessels, and urge that ample force and sufficient funds be provided for a technical and scientific inspection in addition to the present practical methods employed.

1. Provide that there shall be created in the Department of Commerce a board of competent naval architects whose duty it shall be to pass (prior to their construction) upon the plans and specifications of all steam merchant vessels over 100 tons burden.

2. No steam merchant vessel of over 100 tons burden shall be certificated for service until its plans and specifications shall have been approved by the above named board, nor until its safety, seaworthiness, and stability shall have been demonstrated to the satisfaction of said board.

3. Provide methods whereby any and all findings of the boards of local inspectors may be appealed.

4. Provide that whenever the passenger-carrying capacity of a steam merchant vessel is increased by any board of local inspectors, said increase must be approved in writing by the supervising inspector of the district.

5. Provide that any alterations of the original plans and specifications affecting stability, seaworthiness, and safety of any steam merchant vessel must have the approval of the above constituted board of naval architects.

Pending the enactment of this legislation, we suggest the following be immediately incorporated in the rules and regulations of your Department:

1. Increases in passenger-carrying permits must be issued by inspectors only after personal inspection of the vessel, of which inspection a written record shall be made.

2. All inspectors are ordered to require owners of vessels whose stability they have any reason to question to make "inclining tests" on such vessels, under the supervision of expert naval architects provided by the Department of Commerce.

Respectfully submitted.

BOARD OF INQUIRY:

Official members—

WILLIAM A. COLLINS,

FRANK W. VAN PATTEN,

U. S. Local Board of Inspection.

Civilian members—

MARVIN B. POOL.

HARRY A. WHEELER.

BARRATT O'HARA.

PHILIP B. FOUKE.

CHICAGO, ILL., August 5, 1915.

Experts for Hull Construction and Increase in Number of Boiler Inspectors.

A bill to authorize the appointment of the board of naval architects suggested, with an appropriation for its maintenance, and to provide the additional powers recommended by the board of inquiry, is in preparation.

It should be noted, however, that the recommendation of the board of inquiry calling for a board of competent naval architects is not original in this connection, as will be seen by the following recommendation contained in the annual report of the Supervising Inspector General for the fiscal year just closed, the first paragraph of which appeared also in his annual report for the fiscal year ended June 30, 1914:

There should be stationed in the office of the Supervising Inspector General a corps of experts whose business it would be to approve the proposed hull construction. This, it is thought, is necessary (1) because it would enable the Department to employ experts who are more familiar with hull construction than the local inspectors, and (2) it would result in that uniform administration of the law with which the Supervising Inspector General is charged.

* * * * *

It is very essential also that there be a larger number of boiler inspectors, for under present conditions there are many repairs that are being made to boilers that are not followed up, because there is not a sufficiently large force of boiler inspectors to examine these repairs. Anyone who is familiar with boiler-repair work of the present day knows that the use of oxy-acetelene welding is being rapidly extended, and this work should be carefully followed up by the inspectors. It is not so much that there is danger in welding under certain conditions as that the workman who does the welding is not qualified to do it, and there should be a sufficiently large force of boiler inspectors to keep in touch with this work.

The recommendation contained in the first paragraph quoted above was approved in my report for the fiscal year ended June 30, 1914 (p. 173). It was then pointed out by me that "it would be a distinct departure from the principles that have heretofore governed the Steamboat-Inspection Service in the matter of the jurisdiction of local inspectors." This departure I now recommend in accordance with the statement of the Chicago board of inquiry. However, it should be borne in mind that this would require a much larger appropriation than at present, not only to pay the salaries of the experts employed but those of the additional clerks required. I also renew the recommendation made in my last report that "all boilers used on vessels subject to inspection shall first be approved by experts in the office of the Supervising Inspector General. * * * The law should therefore be changed so as to require the approval by the Supervising Inspector General of the design of these boilers."

rendered by British Steamship "Megantic."

led by so many attacks upon life at sea, it is
humanity reasserting itself in saving men and
the natural perils of the ocean. To place on public
service to Americans, a letter which on April 7,
Capt. George R. Metcalfe, of the British steamship
was repeated:

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, April 7, 1915.

The managers of the White Star Line of your part in the
and passengers of the American steamship *Denver* has been

the steamship *Denver* sent out the wireless call, "We are
assistance." Although your ship was then 206 miles
of the *Denver* shown in her distress call, you changed your
course, with a high and dangerous sea running, you went to her
help; you sighted the *Denver* and sent a boat in charge of
rescue, taking off the master of the *Denver* and his
Capt. Smith of the American steamship *Evelyn*, which had
the German coast.

State to recognize in a suitable manner the services of
the British steamship *Megantic* in rescuing American sea-
wreck. In due course you will doubtless receive from
for which the laws of the United States provide.
I wish to assure you of my own appreciation of the high
your command and of your unselfish services to the
an American merchant vessel in distress.

WILLIAM C. REDFIELD, *Secretary*.

International Mercantile Marine Co.,
9 Broadway, New York, N. Y.

to passenger motor boat *Leader*, both of which are on file in this Department, as illustrating the necessity for legislation in the matter of motor boats.

Fireproof Excursion Steamers.

Repeatedly heretofore the Supervising Inspector General has urged that passenger excursion steamers should be constructed of fireproof materials. Reviewing the record of the recommendations to this effect in his report for the fiscal year just closed, the Supervising Inspector General states that "the best way is to remove the cause for such a disaster (referring to the burning of the steamer *General Slocum*) and require absolute fireproof construction of excursion steamers. This can not be done until Congress acts, and the Bureau most earnestly invites attention to the necessity for legislation in this respect."

This matter was treated on page 174 of my report for the fiscal year ended June 30, 1914. I concur in and urge the adoption of the suggestion of the Supervising Inspector General recommending that legislation be enacted to provide that on and after January 1, 1918, passenger excursion steamers carrying 250 passengers or more shall be constructed of strictly fireproof materials.

It is no longer open to doubt that such construction is feasible. The matter has long passed its experimental stage. On November 22, 1906, an address was made by William Gatewood, Esq., before the Society of Naval Architects and Marine Engineers at New York giving particulars of an adaptation of fireproof construction to the excursion steamer *Jamestown*, built by the Newport News Shipbuilding & Dry Dock Co. for the Norfolk & Washington Steamboat Co. The address is accompanied by plans and drawings showing details of construction. It is on file in the library of this Department. Reference may be made in this connection to accident report No. 69984 on the burning of the passenger steamer *Maryland* in Chesapeake Bay, on January 22, 1915. On this occasion the skill of the captain, officers, and crew saved every life on board, but the warning is none the less obvious.

Overloading of Passenger Steamers.

Closely connected with the construction of passenger steamers is the matter of the possible overloading of passenger steamers in use. In the matter of passenger allowances the original responsibility is placed by law upon the local inspectors. A further safeguard in this direction is proposed among the recommendations of the Chi-

chicago board of inquiry above quoted. The Department would be glad if every ship carrying passengers could be measured and tested by experts to determine what the passenger allowance of these vessels should be, but it is impossible to do this under the present provisions of the law. Every effort has been made to impress upon the local inspectors the seriousness of the responsibility which in this respect rests upon them. In the absence of sufficient clerical help and of a sufficient number of inspectors, the Department has been and is seriously concerned lest this vital matter may not always receive the mature and deliberate care it merits and which the public properly expect it to receive. Until, however, the means shall be provided to do this work as it ought to be done, it may in some places be done as it ought not to be done. It is too serious a matter to be done in a hurry, amid the interruptions of inspecting hulls and boilers, examining candidates for licenses, looking after details of equipment, and all the other mass of current business that crowds itself upon a board of local inspectors. If this work is worth doing at all, it is worth doing well, and it is not always certain to be well done if it is done as an incident to an overcrowded day. The inspectors are held to strict account and will continue so to be; but the equity of expecting them to do this or other work as it ought to be done when the conditions are known to be such that they can not so do it is seriously open to question.

Apart from the question of the propriety of greater passenger allowances, the further question whether a steamer carries more passengers than her certificate of inspection permits her to carry demands attention. It is believed that violations of this rule are rare. Statements of excessive loading on the part of spectators are almost never accurate. They usually vary by many hundreds from the facts. Such statements are almost never based upon any actual count or upon any other real attempt to get the truth. They are at best but guesses, usually grotesquely large. The new force of navigation inspectors who under the Bureau of Navigation check the loadings of passenger steamers with mechanical counters are doing their work well and in such a way as to make loading beyond the certificate number a very difficult matter.

Transportation of Dangerous Articles.

In connection with the danger of fire on shipboard is to be considered also the question of the transportation of dangerous articles. The fact is that section 4472, Revised Statutes, which

has been repeatedly amended, does not commence to meet modern conditions. It is possible to-day to transport dangerous articles on steamers carrying passengers that are not "like dangerous articles" to those that are referred to in section 4472, Revised Statutes, and over such a situation as this the Department has no control. Furthermore, the Department has no control over the transportation of dangerous articles on freight steamers, notwithstanding the fact that the lives of persons traveling on passenger steamers may be jeopardized as a result of careless methods followed on freight steamers.

There should be conferred upon the office of the Supervising Inspector General authority to regulate this very dangerous practice. It is, of course, to be borne in mind that the purpose of the Department is not to destroy, but to regulate, commerce, and therefore there are some commodities which if regulated might be transported with comparative safety on steamers carrying passengers, but the regulation of which can not now be undertaken because the Department is without authority to do so.

Here again conditions exist for which the Service is not responsible and which it now and here asks power to remedy.

"Monroe-Nantucket" Disaster.

On February 2, 1914, the following letter was sent to the Commissioner of Navigation:

You are hereby constituted a special committee of this Department, together with Hon. George Uhler, Supervising Inspector General, Steamboat-Inspection Service, to inquire into and consider all facts which have heretofore been brought out in evidence, or which may hereafter be so developed, together with such other circumstances as may be available, in relation to the collision between the steamships *Monroe* and *Nantucket* on the morning of January 30, 1914, with the view of making to the Secretary of Commerce such suggestions as may arise from your study of all the facts forming the environment of this accident, and having bearing upon further securing safety of life at sea.

Your suggestions are invited as to improved action on the part of the Department or any of its bureaus, or as to legislation that should arise in your judgment out of the lessons to be learned from this disaster. Your action is entirely distinct and separate from the regular procedure provided for by law and now in the hands of the local boards of inspectors at Norfolk and Philadelphia. You will take into account the testimony adduced before such boards and will make such other inquiry into the whole subject as is practicable. The local boards will deal with the question of responsibility on the part of the officers of the vessels concerned in the accident. You will deal with the larger questions of the lessons to be learned from it.

The report of the committee thus formed, though not received until October 16, 1915, has bearing upon the work of the fiscal year now being discussed and is therefore printed in full on succeeding pages.

OCTOBER 16, 1915.

HON. WILLIAM C. REDFIELD,

Secretary of Commerce.

SIR: Complying with the instructions of your letter of February 2, 1914, I have read attentively all the typewritten evidence taken at Philadelphia at the investigation of the master of the steamship *Nantucket*, and I attended the investigation at Baltimore of the master of the steamship *Monroe*. The following suggestions are offered:

COURTS OF INQUIRY.

1. A tribunal should be lawfully established for investigations into marine casualties involving serious loss of life, similar generally to the courts of inquiry provided for in the British merchant shipping act and the Canadian merchant shipping act. The need of such a tribunal was shown after the burning of the steamship *General Slocum* in 1904, the capsizing of the steamship *Eastland* this year, and after several serious disasters in the years intervening. The Secretary of Commerce on all of these occasions has recognized that the gravity of the calamity demanded an investigation other than the usual investigation by the board of local inspectors. The special committees or commissions appointed on these occasions have had no legal standing, no lawful power to subpoena and examine witnesses, or to perform those acts necessary to conduct an investigation. Under the authority bestowed by your letter of February 2, 1914, I did not feel at liberty to ask questions at the Baltimore inquiry, as I feared such interruption might invalidate the proceedings. The situation pointed out will continue until Congress bestows upon the Secretary of Commerce powers similar to those enjoyed by the President of the Board of Trade under the British merchant shipping act.

PENALTIES FOR VIOLATING THE INTERNATIONAL RULES OF THE ROAD.

2. For obvious reasons the international regulations for preventing collisions at sea do not contain in themselves specific penalties for violations. Each nation imposes on its own vessels the penalties it sees fit. As the rules, however, govern the courts in determining the vessel or vessels at fault in cases of collision, etc., they in effect carry a penalty in damages when violation results in loss. In the United States a licensed officer who has violated the rules is subject to trial by the local inspectors, and if found guilty is subject to the revocation or suspension of his license, the former penalty amounting to depriving him of his calling and occupation. Furthermore, under section 4493 of the Revised Statutes, "any person sustaining loss, or injury through the carelessness, negligence, or willful misconduct of any master, mate, engineer, or pilot, or his neglect or refusal to obey the laws governing the navigation of such steamers, may sue such master, mate, engineer, or pilot, and recover damages for any such injury caused by any such master, mate, engineer, or pilot."

The British law in serious cases is more severe. Sections 419 and 680 of the merchant shipping act provide:

"419.—(1) All owners and masters of ships shall obey the collision regulations, and shall not carry or exhibit any other lights, or use any other fog signals, than such as are required by those regulations.

"(2) If an infringement of the collision regulations is caused by the wilful default of the master or owner of the ship, that master or owner shall, in respect of each offense be guilty of a misdemeanor.

"(3) If any damage to person or property arises from the nonobservance by any ship of any of the collision regulations, the damage shall be deemed to have been occasioned by the wilful default of the person in charge of the deck of the ship at the time, unless it is shown to the satisfaction of the court that the circumstances of the case made a departure from the regulation necessary.

"(4) Where in case of collision it is proved to the court before whom the case is tried, that any of the collision regulations have been infringed, the ship by which the regu-

lation has been infringed shall be deemed to be in fault, unless it is shown to the satisfaction of the court that the circumstances of the case made departure from the regulation necessary * * *

"68c.—(1) Subject to any special provisions of this Act and to the provisions hereinafter contained with respect to Scotland—

"(a) an offense under this Act declared to be a misdemeanor, shall be punishable by fine or by imprisonment not exceeding two years, with or without hard labour, but may, instead of being prosecuted as a misdemeanor, be prosecuted summarily in manner provided by the Summary Jurisdiction Acts, and if so prosecuted shall be punishable only with imprisonment for a term not exceeding six months, with or without hard labour, or with a fine not exceeding one hundred pounds.

"(b) an offense under this Act made punishable with imprisonment for any term not exceeding six months, with or without hard labour, or by a fine not exceeding one hundred pounds, shall be prosecuted summarily in manner provided by the Summary Jurisdiction Acts."

DECK OFFICERS.

3. When a large ocean passenger steamship is under way in a fog or in crowded waters where there is risk of collision, at least two officers should be on watch on the bridge continuously without even a few moments' break in this double watch. This is desirable for the safe navigation of the ship and the avoidance of collision, and is imperative in the event of a collision in view of the many duties in respect of his passengers as well as of his crew and ship which the master instantly must perform. Electrical and mechanical appliances for safety on shipboard, controlled from the bridge, enable a master to act more promptly and effectively than formerly, but they render the presence of two trained officers familiar with such appliances the more necessary.

During the very few moments which elapsed between the time when those on the steamship *Monroe* first learned of the proximity of the steamship *Nantucket* and the actual collision, at the time when the ships came together and remained briefly together, and for several moments afterwards, the master of the steamship *Monroe* was alone on watch. The other watch officer had been allowed to go to the toilet room nearby, and another officer had not been called temporarily to his place, although the ship had been slowed down apparently on account of thickening fog, in itself evidence of increasing risk.

Such a situation should not be repeated. The act of March 3, 1913, dealt with the subject of licensed mates, but the hearings and reports show, it seems to me, that the hours of labor of these officers were under consideration, rather than the safety of ocean passengers. Ocean passenger and cargo steamers and ocean tugs were treated in the same manner on a tonnage basis. A licensed deck officer in time of accident on an ocean passenger steamship has all the duties to perform which must be performed by such officer on a cargo boat, and in addition urgent duties in respect of the passengers. You are familiar with the difficulties which the Department has found in enforcing the act of March 3, 1913, known as the "three-mates law." It certainly does not in terms meet the situation presented by the *Monroe-Nantucket* collision.

HULL CONSTRUCTION.

4. The provisions of Chapter IV, Construction, of the International Convention on Safety of Life at Sea, should be enacted into law and made applicable to American ships at a date in the future sufficiently removed to give those concerned reasonable opportunity to conform to the requirements. In the meantime, an adequate appropriation should be asked for to conduct through a skilled committee (preferably chosen from the Society of Naval Architects and Marine Engineers, working with the Supervising Inspector General of Steam Vessels), the investigations provided for in article 30 of the international convention.

GENERAL.

5. The matters of an emergency lighting system for boat decks, of self-igniting water lights in lifeboats—both of which would have been serviceable on the steamship *Monroe* immediately after the collision—have already been taken up by the Steamboat-Inspection Service. The Coast and Geodetic Survey and the Lighthouse Bureau are considering changes in the position of certain lightships, with a view to establishing, if feasible, ocean tracks for coastwise steamers north of the Chesapeake capes.

I have spoken to you of the desirability of experiments by the Bureau of Standards in the matters of directive radio communication, and the utility of submarine signals.

Respectfully,

E. T. CHAMBERLAIN, *Commissioner*.

I concur:

GEO. UHLER, *Supervising Inspector General*.

Attention is especially directed to the court of inquiry which is suggested in the above report. On November 13, 1913, a serious storm occurred in portions of the Great Lakes, causing enormous marine disasters. On September 29, 1915, a hurricane prevailed in the lower Mississippi Valley, causing enormous wrecks and a considerable loss of life. This storm was preceded by one of at least equal severity off the coast of Texas. It is not possible for the Steamboat-Inspection Service with the force and funds at its command to investigate these disasters with the painstaking care the law contemplates. For this cause the lessons that may often be learned from the thoughtful study of such disasters, as to the conduct of officers, and as to the nature and quality of vessels, are not learned. The disaster comes and goes and we are little or no wiser by reason of the lesson it teaches. In such a case as the *Monroe-Nantucket* the inquiring body must sit for a continued period. In the case of the hurricanes mentioned the inquiry would have to cover the loss of many ships over wide areas. Officers can not do this well whose days are crowded full of demands for inspection, for examining officers—for a hundred other details required of the steamboat inspectors. The recommendation therefore that a board of inquiry be created to specially study disasters involving serious loss of life or unusual loss to shipping has been approved and legislation will be introduced at the next session of Congress providing for the creation of such board. The further recommendations in the foregoing report are commended to the serious attention of the Congress.

Summary of Proposed Legislation.

I may sum up the further legislation requisite to permit the Steamboat-Inspection Service to carry out its own high ideals of public safety by stating that after the necessary increase of force

and funds requisite both in the office and field in order to permit the work to be as well done as it ought to be these further matters are required:

The enactment into law of the recommendations made by the board of inquiry at Chicago following the *Eastland* disaster.

The enactment of a law requiring fireproof construction of all excursion steamers after January 1, 1918, as previously noted.

The amendment of sections 4417 and 4418, Revised Statutes of the United States, so as to relieve local inspectors of original jurisdiction in the matter of hull and boiler construction, placing the responsibility for this work on the office of the Supervising Inspector General, providing that office with the necessary expert assistance for the purpose.

The division of the first inspection district into two, as heretofore explained.

The enactment of a law providing for the numbering of motor boats and for the proper qualifications for licensed operators thereof.

The amendment of section 4433, Revised Statutes, to provide that the working pressure allowed steam boilers may be determined by the rules of the Board of Supervising Inspectors in order to enable that board to make rules with reference to boiler pressure that are consistent with the best modern practice.

The amendment of section 4464, Revised Statutes, to enable inspectors to control the number of persons that travel on motor boats as passengers and also the number of persons who travel on ferry boats as passengers. Under present conditions dangerous situations may arise that can not be controlled under the present law.

The amendment of section 4472, Revised Statutes, so as to give the Steamboat-Inspection Service authority to better control the transportation of dangerous articles.

The amendment of the law with reference to the appointment of assistant inspectors so that instead of appointing same to certain ports and detailing them to other ports as at present they may be appointed to the port where they are actually to serve.

It is possible that after all accounts are balanced for the fiscal year ended June 30, 1915, there may be turned back into the Treasury a small amount, perhaps \$2,000, on account of the contingent expenses of the Steamboat-Inspection Service. The question may naturally arise why this was not spent in making reinspections. The reason is that the Bureau can not take chances of a

deficit, because there may occur some accident or disaster requiring immediate investigation at considerable expense and the Service can not take the risk of being without funds with which to give such matters prompt attention. The only way possible to secure these funds under present circumstances is by stopping certain necessary work when the danger point seems reached.

It would illustrate how unforeseen yet proper demands may suddenly arise to state that on June 29 three inspectors had to be called from the field (New England and New York) to Washington in connection with the demand for a certificate for the steamer *Lansing*, which vessel was found unseaworthy by several inspectors. In like manner the inquiry following the disaster to the *Eastland* required bringing from Cleveland to Chicago, from Grand Haven to Chicago, as well as from Milwaukee and Detroit to Chicago, six officers of the Service who were needed in connection with the inquiry.

I have spoken with great frankness on the subject of the Steamboat-Inspection Service because I feel very keenly the unjust attacks which are made upon it. I have made it my duty, as it is a privilege, to become personally acquainted with the officers of the Service, of various ranks, from one end of the country to the other and from the Lakes to the Gulf. I am speaking of men whom I personally know and whose work I have seen in saying that the work of the Steamboat-Inspection Service is as a whole admirably well done. The record shows that officers of that Service who are derelict are sharply brought to account and that breaches of discipline and negligence of duty are not tolerated. The spirit of the Service is admirable, and the material which composes it is of the best. No voice is lifted to suggest that improper influences of any nature are successfully exerted upon it. It has a keen sense of its high mission in safeguarding the lives of the 300,000,000 passengers who yearly travel on the vessels under its care. The vast majority of such complaints as are made respecting the Service say that it is too severe. It is only when some serious accident occurs that the public, knowing nothing of the limited force and the narrow means with which the Service must needs work, conscious only that sad harm has come and that there is a force charged by law with the duty of safeguarding life, assumes the Service to have been careless and listens, to say the least, with most reluctant ear to the facts in the case.

It is at such times prone to forget that the Steamboat-Inspection Service can not at its best remove the heavy responsibility that rests upon the licensed officers of ships. Let the inspectors do their utmost, they are not responsible in any degree for the navigation of a vessel, nor can they be held accountable for the mistakes of the officers of the ship.

The Nation wishes the work of its Steamboat-Inspection Service well done, but it can not be well done unless the Nation provides enough men and money to do it well. That is not now done. If and when it shall be done there will, humanly speaking, be little or no occasion for complaint of the effectiveness of the Steamboat-Inspection Service.

BUREAU OF NAVIGATION.

Added Responsibilities of the Commissioner of Navigation.

As is explained in detail in the following pages, Congress has imposed serious additional duties in recent years upon this service, of which three examples which all will remember are the ship-registry act, the seamen's act, and the supervision of the Radio Service throughout the country. The Commissioner of Navigation, however, has been given no added compensation for these serious additions to his responsibility, nor has he been allowed any additional force with which to do the greater work. It is an act of simple justice that his salary under the onerous conditions now imposed by law upon his Bureau should be made equal to that which others similarly situated receive. I shall therefore include in the estimates for the coming year an increase in the salary of the Commissioner of Navigation from \$4,000 to \$5,000. One has but to read the annual report of that service to see that it is readily earned, two whole forces of men not in existence when the present compensation was fixed having since been placed under his direction, viz, the Radio Service and the navigation inspectors.

Increase in American Merchant Marine.

The merchant ships of the United States registered for the foreign trade on June 30, 1915, numbered 2,794 of 1,871,543 gross tons, an increase of 389 vessels and 795,391 gross tons during the year. The one other fact in the history of our merchant marine, comparable in significance to this increase, was the decrease of 709,357 gross tons of American ships in foreign trade between June 30, 1862, and June 30, 1864. Our gain in the ten months following the passage of the ship-registry act of August 18, 1914, has been absolutely and relatively greater than our loss during the two darkest years of the Civil War. Our tonnage for foreign trade is now greater than at any time since 1863.

A year ago maritime nations in the order of their importance in the foreign carrying trade of the world ranked as follows: Great Britain, Germany, Norway, France, Japan, Italy, Netherlands, Sweden, United States. In the year the United States has outstripped Sweden, the Netherlands, and Italy, and drawn up even with Japan. So large a proportion of French ships are employed for military purposes that the difference between the

tonnage of American and French ships in foreign trade can not be very great. While merchant shipping under the British flag conducts about half of the world's carrying trade, the American increase in tonnage during the past year has been greater than the average annual increase of the British Empire during the ten years up to June, 1914, which was 403,000 tons.

The following statement from Lloyd's Register for June 30, 1915, the best authority on maritime statistics available at the moment, shows the changes which have taken place during the year of the war (1914-15), and during the preceding peaceful and prosperous year (1913-14), the figures dealing only with vessels over 100 gross tons, and in the case of the United States including our larger Lake vessels but not those employed on our numerous river systems:

Nationality.	1913	1914	Change from 1913.	1915	Change from 1914.
	<i>Gross tons.</i>	<i>Gross tons.</i>	<i>Gross tons.</i>	<i>Gross tons.</i>	<i>Gross tons.</i>
American.....	5,427,636	5,368,194	— 59,442	5,892,639	+ 524,445
British.....	20,431,543	21,045,049	+ 603,506	21,274,068	+ 229,019
German.....	5,082,061	5,459,296	+ 377,235	4,706,027	— 753,269
Norwegian.....	2,457,890	2,504,722	+ 46,832	2,599,188	+ 24,466
French.....	2,201,164	2,319,438	+ 118,274	2,285,728	— 33,710
Japanese.....	1,500,014	1,708,386	+ 208,372	1,826,068	+ 117,682
Italian.....	1,521,942	1,668,296	+ 146,354	1,736,545	+ 68,249
Dutch.....	1,309,849	1,496,455	+ 186,606	1,522,547	+ 26,092
Swedish.....	1,047,270	1,118,086	+ 70,816	1,122,883	+ 4,797
Other countries.....	5,990,744	6,401,630	+ 410,886	6,366,076	— 35,554
The world.....	46,970,113	49,089,552	+ 2,119,449	49,261,769	+ 172,217

Ship-Registry Act of 1914.

By far the greater part of the increase in American tonnage shown above is due to the ship-registry act of August 18, 1914. That act went into practical operation a few days after the order of the President of the United States of September 4, 1914, suspending in the case of ships registered under the act certain requirements of law. In the 10 months following that date up to the close of the fiscal year on June 30, 1915, American registers were issued to 148 vessels of 523,361 gross tons (338,354 net tons, equivalent to about 800,000 tons dead-weight capacity), and manned by 6,149 men, including masters. The value of the steam vessels registered was \$32,445,786, and of the sail vessels \$946,970, a total of \$33,392,756. This amount is considerably less than the amount the ships would have brought if purchased in the open market at prices obtaining during the greater part of the year. Nearly all these ships were owned by Americans long before the outbreak of

the European war, and the values given are those at which the ships were carried on the books of the owners. In very few cases was there an actual bargain between buyer and seller. Of these ships, 96, of 332,258 gross tons, were formerly under the British flag; 30, of 147,742 gross tons, under the German flag; 5, of 17,401 gross tons, under the Cuban flag; 6, of 10,549 gross tons, under the Belgian flag; 5, of 5,452 gross tons, under the Mexican flag; 1, of 5,275 gross tons, under the Roumanian flag; 1, of 1,352 gross tons, under the Uruguayan flag; 1, of 1,381 gross tons, under the Chilean flag; and 2, of 1,349 gross tons, under the Norwegian flag; 1 yacht, of 602 gross tons, was owned by an American but without documents.

These 148 vessels stand in the names of 63 different owners, the Standard Oil Co. owning 25, of 130,322 gross tons; the United Fruit Co. 24, of 113,243 gross tons; and the United States Steel Products Co. 10, of 48,271 gross tons, while 44 individuals or corporations own but a single ship. The additions to our fleet from this source include 109 steamships of 478,704 gross tons, of which 45 were cargo steamers of 165,565 gross tons, 37 tank steamers of 181,670 gross tons, and 27 passenger steamers of 131,469 gross tons. There were 35 sail vessels of 43,210 gross tons, of which 24 were square-rigged ships or barks aggregating 34,708 gross tons. Four yachts of 1,447 tons were also registered. Five of the vessels registered, aggregating 10,421 gross tons, were lost, however, before the close of the year, so that the actual increase in our shipping in foreign trade under the ship-registry act was 143 vessels of 512,940 gross tons.

Total American Merchant Marine.

The increase of 736,623 gross tons in American shipping in foreign trade comes in part also from the diversion of our ships, formerly in domestic trade, to the foreign trade through the more favorable conditions for competitive employment created by the European war. Indeed, the total increase during the year of American shipping of all kinds, employed in the foreign or domestic trade, was only 460,741 gross tons. This increase, however, is greater than for any previous year in our history. On June 30, 1915, the total documented American shipping comprised 26,701 vessels of 8,389,429 gross tons, compared with 26,943 vessels of 7,928,688 gross tons on June 30, 1914. This merchant fleet, second only to that under the British flag, comprises 6,952 steam vessels of 5,781,416 gross tons, 5,866 sail vessels of 1,384,474 gross tons, 4,327 barges of 999,166 gross tons, 8,996 documented motor

vessels of 162,394 gross tons, and 560 documented canal boats of 61,979 gross tons.

The Census Bureau in 1906 estimated the value of all vessels of the United States, including those not required by acts of Congress to be documented, at \$508,000,000. Assuming that valuation to be approximately correct, the value of all American vessels at the present time doubtless exceeds \$600,000,000, of which fully \$100,000,000 is invested in ships in foreign trade.

Shipbuilding.

The output of our shipyards on the seaboard for the fiscal year ended June 30, 1915—866 vessels of 203,156 tons—was a third less than during the fiscal year 1914, and less, indeed, than for any year of the past 16. This diminished output was anticipated at the outset of the fiscal year on account of the temporarily depressed condition of industry and on account of the temporary diminution of shipbuilding in other countries.

The current fiscal year opens with the prospect of a very large output at home. The conditions in the shipbuilding industry created by the outbreak of the European war were not fully appreciated here until late in the autumn. Contracts were made in the autumn months and in the early months of 1915 which will secure to our shipyards full employment throughout the current fiscal year. On July 1, 1915, our shipyards had under construction or under contract 62 steel vessels of 294,138 tons, the largest volume of work of this description on record. The total for the year will doubtless be about 400,000 tons. The shipyards on the Great Lakes, however, had at the close of the fiscal year relatively little new work, and for this reason the output for the entire country may not equal some of the record years in our comparatively recent history. Half of the tonnage mentioned now under construction or contract is made up of steamers specially built to carry oil in bulk. It is to be noted also that a third of the tonnage brought under the American flag by the ship-registry act of 1914 consisted of vessels of the same type, and of the larger steamers built in the country last year one-third of the tonnage was also tank steamers.

Navigation Receipts.

The receipts from tonnage duties last year were \$1,315,425.30, compared with \$1,310,759.03 for the previous year, and are the largest annual receipts from this source in over 30 years. The slight increase over the fiscal year 1914 was not looked for, as

it was generally expected that receipts from this source would be considerably reduced in consequence of diminished foreign trade owing to the European war. Again, by modifications in the measurement regulations, reducing somewhat net tonnage on which these duties are levied, a further diminution of receipts had been expected. Marked changes, of course, have taken place in the nationalities and types of the ocean carriers of our foreign commerce. The following table shows concisely the share of tonnage taxes paid by vessels under the American flag for the two years, under other neutral flags, and under the flags of the six allied nations on the one hand and the Austro-Hungarian and German flags on the other:

	1914	1915	Increase (+) or de- crease (-).
American.....	\$77,445.06	\$104,736.73	+\$27,291.67
Other neutrals.....	147,106.18	267,821.04	+120,714.86
Belgian, British, French, Italian, Japanese, and Russian.....	875,737.20	914,063.95	+ 38,326.75
Austro-Hungarian and German.....	210,470.59	28,803.58	-181,667.01
Total.....	1,310,759.03	1,315,425.30	+ 4,666.27

Tonnage duties are levied on five voyages a year at the rate of 6 cents per net ton on vessels arriving from oversea ports and 2 cents on vessels arriving from ports of North America, Central America, Mexico, and the West Indies. The large and fast trans-Atlantic passenger liners make 10 or 12 voyages a year, and all entries after the fifth are exempt from tonnage duties. Many of these large steamers have been withdrawn from regular service and employed as transports to carry the troops and reservists from all parts of the world to the several scenes of military operations. These steamers in ordinary times are employed chiefly in the transportation of immigrants and hundreds of thousands of those who cross the oceans for pleasure. Immigration and pleasure travel have been very greatly reduced. Military necessity and changed trade conditions have thus withdrawn these fast passenger ships and their places have been supplied to a very great extent by slow cargo steamers, and even by sailing vessels. These vessels make fewer voyages during a year, and, accordingly, pay tonnage duties on every entry, or nearly every entry. The same conditions, so far as can now be foreseen, are likely to continue throughout the current fiscal year, and in that event there will be no reason for a material change in the receipts from tonnage duties during the current year. Our rates of tonnage duties are as a rule less than the

corresponding charges levied in the ports of South America, Europe, Asia, and Africa, and I wish again to emphasize the fact that "these duties are imposed without discrimination on vessels of the United States and vessels of foreign nations under reciprocal treaties entitled to equal treatment with vessels of the United States, and, consequently, are in no sense a handicap on American shipping."

The receipts from navigation fees for the year amounted to \$142,446.37, a decrease of \$10,247.82 compared with last year. The cost of collecting these fees is relatively large, and, as stated in this report last year, the Department will favor the abolition of the fees whenever a reduction of the revenues may be practicable.

The collections from navigation fines during the year amounted to \$41,518.24, an increase of \$776.86 over last year. The working, thus far, of the agencies which Congress has placed at the command of the Department during the current fiscal year indicates an increase in receipts this year from this source.

The receipts from the three sources named aggregate \$1,499,389.91, a decrease of \$4,804.69 compared with last year. In addition to these annual revenues the sum of \$37,976.30 was collected during the year under section 37 of the tariff act of 1899 imposing an excise upon foreign-built yachts owned by Americans. This is an extraordinary receipt and represents the principal and interest collected under the decision of the Supreme Court of the United States in the case of *Billings v. The United States* (232 U. S., 261). The law imposing this tax was repealed by the tariff act of October 3, 1913, and only a few cases remain to be settled.

The total cost of maintaining the Bureau of Navigation for the fiscal year ended June 30, 1915, was \$187,030. It will therefore be seen that the receipts collected under the general supervision of this service and those arising from its operations are more than eight times greater than the total cost of maintaining the service. The work of the Bureau of Navigation has enormously increased within the last year because Congress through legislation has imposed serious and burdensome duties upon it without allowing any greater compensation or any additional force. The clerical staff is the same in number to-day as it was in 1884. There have recently been imposed upon it by law the supervision of the Radio Service, the supervision of motor boats, the counting of passengers upon excursion vessels, the ship-registry act, and the seamen's act, in addition to the enforcing of the navigation laws upon hundreds of thousands of small vessels all over the country. To this the consideration of questions in connection with the admeasurement

of vessels for the Panama Canal should be added. It is literally impossible to carry out these laws with the present force, which is totally inadequate to perform the services required by law. Therefore the estimates for the coming year will show an addition to the clerical force, not as a thing to be desired but as a matter of necessity without which the work can not be done. The increase in the work of this service has not arisen of its own motion, but has been imposed upon it from without by the will of Congress. It is the desire of the service to carry out this will, but it can not do it with the means and the men now provided.

Shipping Commissioners.

Shipping commissioners at 15 seaports shipped, reshipped, and discharged during the year 414,744 seamen on vessels of the United States, an increase of 35,972 compared with the previous year. The amount of salaries was \$63,755.47, an increase of \$280.27. The number of men shipped, reshipped, and discharged at New York was 247,833, an increase of 43,486 over last year, and at New Orleans 27,687, an increase of 16,121 over last year. At San Francisco, however, the number was only 29,285, a decrease of 25,093. Last year the estimates provided for additional clerks at New York and New Orleans, and the recommendation is earnestly renewed. Before any new shipping commissioners' offices are established it would be well to man those we already have with a force sufficient to perform the necessary work. Various make-shifts at present have to be resorted to to enable the New York and New Orleans offices to meet the large increase in work resulting from the ship-registry act of August 18, 1914.

The returns of shipping commissioners give an approximate idea of the nationality of the men who compose the crews of our merchant ships. These returns are based on shipments during the year, and when, as is usually the case, the same seaman ships for several voyages before a commissioner he is counted each time in the returns. Bearing this in mind, of the 218,541 men reported shipped 65,196 were native-born Americans, 29,965 naturalized Americans, 29,395 British subjects, 25,252 Spaniards, and 21,853 Norwegians, Swedes, and Danes. The remainder is made up of men of various nationalities from all parts of the world. These figures, it may be added, do not include seamen shipped on American ships abroad before consuls. Of such, 6,233, mainly Asiatics, were shipped at Hongkong and 9,106 at Liverpool and Southampton, England, for the American Line and Red Star Line steamers, nearly all of whom were British subjects.

When I appeared with the Commissioner of Navigation before the Appropriations Committee of the Sixty-third Congress at its third session, I was obliged to tell them the plain truth, to the effect that the contingent appropriation for the Bureau of Navigation was not sufficient to pay the ordinary running expenses for that service, and to say further that unless they could increase the appropriation for the coming fiscal year it would be necessary to drop some of the offices in cities where shipping commissioners were located. The contingent fund was not increased and the appropriation was omitted for the offices of the shipping commissioners at Bath, Me., Gloucester, Mass., and Pascagoula, Miss., which offices were accordingly closed at the opening of the fiscal year.

Radio Communication.

The work of the Bureau of Navigation in enforcing the two acts relating to radio communication and the international convention has been materially extended. The radio inspectors conducted their work at 74 places, and the system of radio inspection may now be said to have been fairly established through the country, though it has not yet been possible to inspect the Alaska stations. The number of ship inspections this year was 6,155, compared with 6,484 for the previous year, the decrease being due to the fact that smaller ships not required to carry wireless apparatus have taken the place during the European war of larger ships subject to inspection. The number of land stations inspected was 560, compared with 368 for the previous year, and the number of operators examined as to qualifications was 3,194, compared with 2,245 in 1914. The total number of stations licensed was 4,039, compared with 2,309 during the previous year, and the total number of licenses issued to operators was 4,859, compared with 1,548 in 1914. The total number of operators licensed, including amateurs, is 10,973. The voluntary and statutory use of radiotelegraphy, as I stated last year, is increasing rapidly, and a moderate annual increase in the appropriation is needed. It is particularly gratifying to be able to state that in all instances of marine casualties in which wireless telegraphy could play a part the apparatus subjected to inspection by the Department's service performed its work satisfactorily both as to the main set and as to the auxiliary power, which is of growing importance. Incomplete records, which the Department has now begun to assemble, show 36 marine casualties during the year in which the wireless system on ships inspected by the Department contributed to the saving of life and property. The

wireless service on shipboard is relatively new, and the highest standards of fearlessness and devotion to duty established from the beginning are commendable. During the year the Department has started the organization of a corps d'elite among operators of specially high qualifications, to which a special license is awarded. It now numbers 21.

Enforcement of Navigation Laws.

This work has continued throughout the year with steadily increasing efficiency. During the fiscal year 1915, 6,860 violations of the navigation laws were reported to the Department for action, as compared with 6,720 for the fiscal year 1914.

During the summer of 1914 the motor boat *Tarragon* continued the work of inspection along the entire New England coast and as far south as the North Carolina sounds. On the opening of the oyster season close attention was given to the oyster fleet and the improvement of the condition of the 3,500 men employed on those vessels. It was discovered that the practice of putting the men ashore after the season had closed without the full payment of their wages was increasing. The difficulty of securing service on the masters of these vessels was such that it became necessary to appoint the commander of the *Tarragon* a deputy United States marshal for all the districts bordering on Chesapeake Bay and the North Carolina sounds. Vigorous action was taken, and complaints of this nature have now practically ceased.

During the year the Department purchased the motor boat *Dixie*, a stanch, serviceable vessel of 52 gross tons having a speed of about 15 miles an hour. This vessel is a little larger than the *Tarragon*, which was found too small for securing the best results in New England waters. This vessel did not go into commission, however, until July 1, 1915. She will operate in New England waters during the summer and in southern waters during the winter.

It is believed that with these two vessels, supplemented by the occasional hire of motor boats by collectors of customs, a systematic inspection may be made of the entire Atlantic coast.

The work of these vessels is not confined to motor boats. Their crews are constantly employed in the general supervision of the equipment and navigation of vessels of all sizes in Atlantic coast waters.

It is proposed during the coming year to install a first-class wireless equipment on the *Dixie*, in order that her work also may extend to the testing and inspection of wireless apparatus on steamers carrying passengers from our ports.

The work of the inspection service in detail is shown by the following tables:

VIOLATIONS OF NAVIGATION LAWS, SHOWING THE WORK DONE BY THE COAST GUARD, THE MOTOR VESSEL "TARRAGON," LOCAL INSPECTORS OF STREAM VESSELS, RADIO INSPECTORS, CUSTOMS OFFICERS, AND NAVIGATION INSPECTORS, FISCAL YEAR ENDED JUNE 30, 1915.^a

[The work of the customs officers under allotments made by the Department are shown in the last column.]

Port.	Coast Guard.	Tarragon.	Local inspectors.	Radio inspectors.	Customs officers.	Navigation inspectors.	Total.	Cases reported under allotments.
Baltimore.....	30	107	6	.....	51	200	394	.....
Boston.....	46	80	30	12	268	.....	436	.....
Bridgeport.....	5	56	6	.....	49	.....	116	.....
Buffalo.....	19	.....	4	.....	6	12	41	.....
Charleston.....	40	5	15	.....	33	.....	93	.....
Chicago.....	167	.....	1	10	.....	.....	178	168
Cleveland.....	10	.....	10	1	83	.....	104	66
Denver.....	.....	.....	.....	.....	.....	.....	.....	.....
Des Moines.....	64	.....	.....	.....	22	.....	86	11
Detroit.....	125	.....	5	.....	134	28	292	41
Duluth.....	6	.....	5	.....	23	30	64	.....
Eagle Pass.....	.....	.....	.....	.....	.....	.....	.....	.....
El Paso.....	.....	.....	.....	.....	.....	.....	.....	.....
Galveston.....	.....	.....	17	.....	32	.....	49	.....
Great Falls.....	.....	.....	.....	.....	.....	.....	.....	.....
Honolulu.....	4	.....	.....	.....	8	.....	12	.....
Indianapolis.....	.....	.....	1	.....	1	3	5	.....
Juneau.....	7	.....	2	.....	36	.....	45	.....
Laredo.....	.....	.....	.....	.....	2	.....	2	.....
Los Angeles.....	1	.....	2	.....	179	.....	182	150
Louisville.....	.....	.....	1	.....	53	.....	54	33
Memphis.....	.....	.....	2	.....	42	10	54	.....
Milwaukee.....	6	.....	2	.....	.....	.....	8	.....
Mobile.....	6	.....	1	.....	100	.....	107	.....
New Orleans.....	67	.....	20	1	80	.....	168	.....
New York.....	54	271	117	4	147	23	616	45
Nogales.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk.....	35	54	18	.....	119	108	334	.....
Ogdensburg.....	.....	.....	.....	.....	40	.....	40	36
Omaha.....	.....	.....	.....	.....	.....	.....	.....	.....
Pembina.....	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia.....	9	48	8	.....	216	585	866	.....
Pittsburgh.....	.....	.....	8	.....	5	.....	13	.....
Port Arthur.....	.....	.....	1	.....	32	.....	33	.....
Portland, Me.....	14	495	9	.....	52	.....	570	.....
Portland, Oreg.....	.....	.....	2	.....	272	.....	274	256
Providence.....	.....	.....	7	.....	14	.....	21	.....
Rochester.....	.....	.....	1	.....	27	.....	28	27
St. Albans.....	.....	.....	.....	.....	3	.....	3	.....
St. Louis.....	20	.....	2	.....	166	.....	188	147
St. Paul.....	.....	.....	.....	.....	1	.....	1	.....

^a This statement is based on reports made by collectors of customs on Cat. 1078, and is approximately correct. At Chicago and San Francisco, however, allotments made by the Department were used by Coast Guard officers, and that service, as well as the allotment, has been credited with the results. The statement of cases reported under the Department's service is necessarily approximate only.

VIOLATIONS OF NAVIGATION LAWS, SHOWING THE WORK DONE BY THE COAST GUARD, THE MOTOR VESSEL "TARRAGON," LOCAL INSPECTORS OF STEAM VESSELS, RADIO INSPECTORS, CUSTOMS OFFICERS, AND NAVIGATION INSPECTORS, FISCAL YEAR ENDED JUNE 30, 1915—Continued.

Port.	Coast Guard	Tarragon.	Local inspectors.	Radio inspectors.	Customs officers.	Navigation inspectors.	Total.	Cases reported under allotments.
Salt Lake City.....								
San Francisco.....	418			15	30		463	418
San Juan.....	2				21		23	
Savannah.....	42	7	10		20		79	
Seattle.....	150		5		154		309	3
Tampa.....	31	126	30	1	124		312	
Wilmington, N. C.....	2	176	13		6		197	
Total—								
1915 (48 ports).....	1,380	1,425	361	34	2,661	999	6,860	1,401
1914 (49 ports).....	922	1,762	734	27	3,275		6,720	1,325

VIOLATIONS OF NAVIGATION LAWS REPORTED TO THE VARIOUS COLLECTORS OF CUSTOMS, SHOWING THE LAWS VIOLATED, FISCAL YEAR ENDED JUNE 30, 1915.

Port.	Steamboat laws (4399-4500, R. S.).	Motor-boat law, "Rules of road."	Surrendered license (4345-4346, R. S.).	Bills of health (Feb. 15, 1893). ^a	Anchorage and St. Marys River rules.	Passenger act (Aug. 2, 1892).	Enrollment and license (4356, R. S.).	Entry and clearance (4197, 2774, R. S.).	Name on vessel (4178, R. S.).	Change of master (4335, R. S.).	Unloading and coasting laws.	Radio-communication laws.	Miscellaneous.	Total.
Baltimore.....	15	286	28				1		61	3				376
Boston.....	31	310	70				2	4	4	1	2	16		440
Bridgeport.....	5	87	18					1	4		2		1	118
Buffalo.....	2	34			4		2							48
Charleston.....	20	30	19				1		16	3	1		1	91
Chicago.....	3	166	3		1		2		1	2				178
Cleveland.....	16	71	10				1	3	2			1		104
Denver.....														
Des Moines.....		74	10				1							85
Detroit.....	8	244	30		4			4	1	1	1			293
Duluth.....	4	32	22		2		1				1			62
Eagle Pass.....														
El Paso.....														
Galveston.....	27	1	7					5			8		1	40
Great Falls.....														
Honolulu.....	2	4	1			1			2		4			14
Indianapolis.....		5												5
Juneau.....	5	7	23				1		2		4		1	43
Laredo.....			2											2
Los Angeles.....	5	148	14					1		1	8		5	182
Louisville.....	2	36	20											58
Memphis.....	2	8	39								2		1	52
Milwaukee.....	2	5								1				8
Mobile.....	4	16	58			1		26	2					107

^a Bills of health cases transferred to Treasury Department July 24, 1912.

VIOLATIONS OF NAVIGATION LAWS REPORTED TO THE VARIOUS COLLECTORS OF CUSTOMS, SHOWING THE LAWS VIOLATED, FISCAL YEAR ENDED JUNE 30, 1915—
Continued.

Port.	Steamboat laws (4109-4100, R. S.).	Motor-boat laws "Rules of road."	Surrendered license (4115-4116, R. S.).	Bills of health (Feb. 15, 1901).	Anchorage and St. Marys River rules.	Passenger act (Aug. 9, 1885).	Karolinent and Il- cense (4116 R. S.).	Entry and clearance (4107, 4174, R. S.).	Name on vessel (4178, R. S.).	Change of master (4115, R. S.).	Unloading and coast- ing laws.	Radio-communication laws.	Miscellaneous.	Total.
New Orleans.....	27	89	51						2		2	2		173
New York.....	142	378	62				10		10	7	4	4	5	622
Nogales.....														
Norfolk.....	12	154	105				6		35	1	2			335
Ogdensburg.....	2	35	1								2			40
Omaha.....														
Pembina.....														
Philadelphia.....	52	657	74				43		24	15	2			867
Pittsburgh.....	8	1	3										1	13
Port Arthur.....	25		6			1					1			33
Portland, Me.....	22	483	50					10		1				566
Portland, Oreg.....	7	250	2				4		6	3			1	273
Providence.....	3	4	12										2	21
Rochester.....	1	27												28
St. Albans.....		3												3
St. Louis.....	2	145	31						1	1	5		1	186
St. Paul.....		1												1
Salt Lake City.....														
San Francisco.....	76	181	26			4	19	6	63	14	30	12	15	446
San Juan.....	7	6	10				1	1	1	2				28
Savannah.....	16	40	4				1	1	10		5		1	78
Seattle.....	12	142	104			4	4	5	29	2	2	1	1	306
Tampa, Fla.....	60	153	60				1		27	4	3	1	5	314
Wilmington, N. C.....	24	149	7				2		21	3				206
Total—														
1915 (48 ports) ^a	671	4,462	982		11	10	104	41	348	67	93	37	42	8,868
1914 (49 ports) ^a	768	4,838	631		8	25	41	26	153	59	90	36	45	6,720
1913 (107 ports).....	333	2,783	23		23	8	24	10	83	26	1	40	152	3,506
1912 (105 ports).....	165	3,119	96	3	12	17	38	39	81	12			59	3,634
1911 (92 ports).....	182	1,811	23	41	17	45	10	16	43	30			50	2,268
1910 (74 ports).....	252	488	17	52	13	61	13	16	68	12	2		76	1,070
1909 (64 ports).....	151	710	33	69	3	21	14	7	59		4		63	1,134
1908 (73 ports).....	245	385	12	42	6	21	23	18	30	7	2		61	852
1907 (66 ports).....	209	92	88	36	18	62	9	23	52	27	5		63	684
1906 (77 ports).....	194	130	114	41	13	27	10	6	49	5	9		72	670
1905 (63 ports).....	142	53	99	42	13	21	26	7	20	11	28		62	524
1904 (66 ports).....	184	93	101	48	49	16	29	12	24	19	(b)		131	706

^a Reports are now made by subports through the principal port of the district.

^b Included under "Miscellaneous" in 1904 report.

The estimate of the service for the enforcement of the navigation laws will call for an increase of \$13,000 per annum over the present appropriation, making a total of \$35,000. This is to permit the purchase of a motor vessel for enforcing the navigation

laws on the Mississippi and Ohio Rivers and their tributaries and to allot local collectors of customs for the hire of motor boats for this purpose the sum of \$2,270. As has been already stated, the operations of the motor vessels *Dixie* and *Tarragon* on the Atlantic coast are self-sustaining. They have resulted in widespread knowledge of the navigation laws which are now followed to an extent never before approximated. The waters of the Mississippi River and its tributaries are not patrolled and are practically the only waters thus neglected, for there are no Coast Guard vessels on them. Collectors of customs on these rivers estimate the following motor boats and small vessels:

Port.	Vessels.	Port.	Vessels.
New Orleans.....	4,000	Evansville.....	775
Memphis.....	450	Louisville.....	700
St. Louis.....	5,000	Cincinnati.....	498
Chicago.....	1,400	Dayton.....	150
Peoria.....	1,500	Pittsburgh.....	1,000
Rock Island.....	265	Wheeling.....	250
Milwaukee.....	2,500		
Des Moines.....	3,000	Total.....	22,488
St. Paul.....	1,000		

In addition to the above, the vessel during the winter season would make inspections at Gulf ports in Texas, Louisiana, Mississippi, Alabama, and the west coast of Florida.

Collectors of customs advise that the trifling allotments made them heretofore have developed almost total ignorance of the laws providing for safety equipment on the part of owners outside of the principal river ports. The nature of the waters is such that currents, shallows, and floating obstructions offer a menace to small vessels rarely if anywhere found to an equal extent. Hence the need for knowledge of and compliance with the laws is unusually great.

Collectors of customs at all these river ports urge the need for systematic inspection. The Mississippi Valley Power Boat Association, comprised of 60 clubs, with a membership of about 15,000, is in accord with the service. The proposed motor vessel would be available to patrol courses when regattas are held. She would be equipped with wireless and be of service in time of flood. She would provide a supervision not now possible for excursion steamers carrying hundreds of thousands of passengers.

It is important to note in addition that this work is correcting the evils against which it is directed. In the Potomac River; in the sounds of North Carolina; in many other places the owners of small vessels show a commendable desire to comply with the laws when once they are informed concerning them and are satisfied that they are being equally enforced.

Since the passage of the act of June 9, 1910, there has developed a tendency on the part of certain motor-boat owners found in violation of the navigation laws to give fictitious names to the inspecting officer, resulting in their escaping any punishment for their infraction of the law. The practice is steadily growing, until of 670 cases discovered in the New York collection district at least 25 per cent of the owners could not be found.

It also developed that at least 50 per cent of the time of making inspections was consumed and a great deal of annoyance caused to motor-boat owners by the difficulty met by the inspection officers in securing the names and addresses of such owners.

Under existing law also there is no restriction on the number of passengers which a motor boat may carry, and in several localities our officers found vessels loaded with passengers far beyond the limits of safety, but were unable to prevent this dangerous navigation if the vessel was fully equipped with life-saving devices. Passengers are being carried for hire by operators who know little or nothing of the rules of the road and but little more about the operation of their engines and the steps to be taken in case of accident or in an emergency.

The Department is satisfied if motor vessels carry the equipment now required by statute and are carefully navigated that a reasonable degree of safety will be secured except in the case of vessels carrying large numbers of passengers.

This matter was brought to the attention of representative motor-boat owners, builders, and yachting organizations and associations. On June 10 a conference on this subject was held in this Department and after full consideration a proposition requiring the numbering of all undocumented vessels propelled by machinery, excepting those of 16 feet or under temporarily equipped with detachable motors, was approved and also a proposition that all motor boats not now covered by statute, carrying 20 or more passengers for hire, should be inspected, be limited as to the number of passengers they should carry, and the operator be examined as to his general knowledge of the machinery and of the waters on which the vessel is to navigate.

I am satisfied that in the interests of the enforcement of the existing law and the proper protection of the passengers on crowded motor boats this additional legislation should receive the favorable consideration of Congress.

Navigation Inspectors.

On July 29, 1914, the Congress provided \$15,000 for the hire of navigation inspectors to be employed in connection with custom officers in preventing the overcrowding of vessels. There were not available a sufficient number of persons eligible for appointment to this position and a special civil-service register was created after a careful examination as to the intelligence and qualifications of the applicants. This examination was such as to enable us to secure a number of young men working their way through college who could accept this summer employment. After two years' service these men are eligible for transfer to any other branch of the service, and this additional inducement enabled the Department to secure an especially high grade of men for this work. It will be a nucleus which can be drawn upon in the future in establishing field forces in the Navigation Service.

The results during the latter part of the summer of 1914 and the spring of 1915 have amply justified the Department's expectations. During this period these inspectors counted 1,439,273 passengers on 5,061 trips. On 92 occasions the inspectors stopped passengers from going on board, as the limit permitted the vessel had been reached. The safety of 95,293 passengers was involved in these cases. It is fair to presume that on at least a portion of these occasions an excess of passengers would have been carried had our inspectors not been present.

In addition to the work of counting passengers these inspectors, while not so employed, discovered 999 violations of the navigation laws, most of these being the failure of motor boats to have proper equipment.

The work of the inspectors is not confined to counting passengers, but they are alert to see that all vessels carrying such passengers are properly equipped, manned, and as far as possible navigated in accordance with the law. When this service is fully organized, between 60 and 70 inspectors, carefully trained in their work and fully imbued with the seriousness of the work in which they are engaged, will be employed.

Passenger Act of 1882.

During the year ended June 30, 1914, passenger steamers subject to the passenger act of 1882 carried 1,016,453 steerage passengers on 1,797 voyages to ports of the United States where they were subject to detailed inspection. As a consequence of the European war, during the year ended June 30, 1915, such steamers carried only 211,509 steerage passengers on only 956 voyages. Of this greatly reduced number the month of July before the outbreak of the war, and the month of August, when many Americans came home in the steerage, furnished 322 of the voyages and 110,021 of the steerage passengers. The law has been carefully enforced during the year as to outgoing and incoming steamers.

Load-Line Regulation.

The number of our ocean cargo steamers has increased so rapidly that the matter of load-line regulation ought not to be postponed beyond the present session of Congress. This subject is one of some intricacy, and if our cargo ships are to compete in foreign trade with similar ships of other nations our rules ought to be reasonably similar to those adopted by other countries. The most satisfactory method of meeting this question, of course, would be by international agreement, and twice this Department has asked Congress for an appropriation for American representation at a proposed international load-line conference. Such a conference, of course, can not now be expected to meet for several years, until the war has closed and nations have resumed normal trade relations. We can not postpone the subject so long. The subject matter, of course, is within the jurisdiction of this Department. It seems to me that the practical method of meeting the situation would be to empower the Department to employ, say, three experts to frame the necessary regulations. These regulations, if approved by the Secretary of Commerce, should have the force of law, or, if Congress should prefer, such regulations might be submitted for its approval later in the session. The matter is of so much importance both to the safety of shipping and to commercial competition that men of the highest standing should be selected to draft the regulations. These men, of course, should be adequately paid for their work, and provision should be made for the necessary clerical assistance and other expenses. A bill to carry out the above recommendations and to provide the necessary force and funds will be introduced at the coming session of Congress.

Service Rendered by British Steamship "Megantic."

In a year marked by so many attacks upon life at sea, it is some relief to find humanity reasserting itself in saving men and women from the natural perils of the ocean. To place on public record an unselfish service to Americans, a letter which on April 7, 1915, I sent to Capt. George R. Metcalfe, of the British steamship *Megantic*, is here repeated:

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,

Washington, April 7, 1915.

DEAR SIR: Your report to the managers of the White Star Line of your part in the rescue of the captain, crew, and passengers of the American steamship *Denver* has been laid before me.

On March 22 at 3.30 p. m. the steamship *Denver* sent out the wireless call, "We are sinking and in urgent need of assistance." Although your ship was then 206 miles distant from the position of the *Denver* shown in her distress call, you changed your course and in a whole gale, with a high and dangerous sea running, you went to her rescue. On the 23d at 4.10 p. m. you sighted the *Denver* and sent a boat in charge of First Officer Fred J. Bard to her rescue, taking off the master of the *Denver* and his wife, 13 of the crew, and Capt. Smith of the American steamship *Evelyn*, which had been sunk by mines on the German coast.

I have asked the Secretary of State to recognize in a suitable manner the services of yourself and of the crew of the British steamship *Megantic* in rescuing American seamen and citizens from shipwreck. In due course you will doubtless receive from him the material acknowledgment for which the laws of the United States provide. In the meantime, however, I wish to assure you of my own appreciation of the high courage of yourself and those under your command and of your unselfish services to the officers, crew, and passengers of an American merchant vessel in distress.

Respectfully,

WILLIAM C. REDFIELD, *Secretary.*

Capt. GEORGE R. METCALFE,

Steamship "Megantic," International Mercantile Marine Co.,

9 Broadway, New York, N. Y.

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ANNUAL REPORT

OF THE

U.S. Dept. of

SECRETARY OF COMMERCE

1916



WASHINGTON
GOVERNMENT PRINTING OFFICE
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GOVERNMENT PRINTING OFFICE
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ANNUAL REPORT
OF THE
SECRETARY OF COMMERCE.

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, October 30, 1916.

To the PRESIDENT:

I have the honor to submit herewith my fourth annual report, covering the operations and condition of the Department during the fiscal year which ended June 30, 1916, and tracing in a general way its history to October 1, 1916.

The organization of the Department was not altered during the fiscal year. Soon after the year closed, however, by the act approved September 8, 1916, the cost of production division of the Bureau of Foreign and Domestic Commerce was ordered to be transferred to the Tariff Commission created by that act. At this writing the transfer has not been made because the organization of the Tariff Commission is not completed.

Injustice to Traveling Employees.

The injustice to certain traveling employees of the Department, to which I referred in my last report, continues. They are still limited by law to \$5 per diem for all subsistence expenses while required to travel in regions where it is impossible to subsist on that sum. The matter has been brought during the year before committees of both Houses of Congress without avail. It remains true to-day that employees, some of them but modestly paid, are required to pay out of their own pockets expenses incurred solely for Government purposes. The practice is wrong and, though required by law, is without excuse. It is a simple thing to remedy the evil while providing ample safeguards against extravagance. The law now takes an unfair advantage of faithful public servants, and I again enter my earnest protest against it. Publicity and responsibility are the surest safeguards against improper expenditure. The Department welcomes the strictest obligation

in both respects, but it protests against remedying one wrong by committing another and against the enforced docking of the salaries of men who must needs contribute out of modest personal means toward the expenses which a rich and powerful nation requires them in the course of their duty to it to incur for its account.

Space in Commerce Building.

An appropriation has been made by Congress, as recommended in my last report, to provide quarters for the Federal Trade Commission. At this writing that body is still housed in the Commerce Building, greatly to the detriment of the work of the Department of Commerce. It is my earnest hope that suitable quarters for the Federal Trade Commission may soon be found in order to permit this Department to utilize the space in the building it occupies which its work urgently requires. The Federal Trade Commission occupies 13,683 square feet. The Department needs for its own uses not less than 16,000 square feet more than it now has.

Attendance at Trade Conventions and Meetings.

I renew the protest in my last report against the provision of law which forbids the payment from any appropriation of "expenses of attendance of any person at any meeting or convention of members of any society or association, unless such fees, dues, or expenses are authorized to be paid by specific appropriations for such purposes or are provided for in express terms in some general appropriation." In my report for the year ended June 30, 1914, I said:

It surely was not the intention that the law should prohibit the commercial representatives of the country from making known directly to business organizations the information which they have traveled far and labored hard to get, yet this is the effect of the restriction embodied in the law.

In my report of last year I said:

It is absurd that an officer of the United States, having gathered at public cost valuable information for the benefit of manufacturers all over the land, should not be permitted to lay those facts before a convention of such manufacturers except at his own personal expense or when some other reason for his presence can be contrived.

It still remains true that, although we gather at public expense all over the world important facts which our merchants and manufacturers need to know, we are by law placed in the absurd position that having thus gathered this knowledge we are not permitted at public cost to go before "any meeting or convention" of any busi-

ness or trade organization to tell them what we have learned in their behalf. Here, again, to remedy an evil another and a worse one is done and one which goes far to nullify wise and progressive laws intended for the benefit of the business and scientific world. By special provision of law the Bureau of Standards is permitted to send representatives to such meetings and conventions. The same authorization should be given to the Bureau of Foreign and Domestic Commerce, the Coast and Geodetic Survey, the Bureau of Fisheries, and the Bureau of the Census.

Civilian Crews for Fisheries Vessels.

It is generally known that the Navy requires officers and men, yet, as I have previously recorded, the steamers *Albatross* and *Fish Hawk*, of the Fisheries Service, are operated by naval crews commanded by warrant officers of the Navy whose services are not required to operate those vessels. The work is well done, but it could be done much more cheaply than it now is. If the present naval crews were transferred to the regular work of the Navy Department, and civilian crews replaced them, there would be an annual saving to the Government of over \$27,000 a year. The matter was brought before Congress during the fiscal year, but without result.

A wise increase in funds for the maintenance of vessels in the Fisheries Service has permitted the use of the *Albatross* in connection with the tuna fisheries during the fiscal year.

Vessels of the Department's Marine Services.

The construction of the lighthouse tender *Cedar*, at Long Beach, Cal., has been greatly delayed by a strike and by the difficulty in securing material. It is now expected that the vessel will be launched in December. The *Cedar* will be the largest steamer in the Service. The medium-draft tender *Rose* was launched February 19, 1916. Contract for the construction of the shallow-draft tender *Palmetto* was made on September 27, 1915. Contract has also been awarded for the construction of a relief light vessel, No. 99, for the Great Lakes, at East Boothbay Harbor, Me.

The new Coast Survey steamer *Surveyor*, under construction at Manitowoc, Wis., has been launched and will be completed by the close of the autumn. The steamers *Gedney* and *McArthur*, of the Coast Survey, have been condemned and sold as unfit for further use. In my last report I pointed out that the steamer *Patterson*, of this Service, will hardly last till a new steamer can replace her. She is 37 years old, weak, underpowered, worn out. The esti-

Status of "Eastland" Inquiry.

The completion of the inquiry made pursuant to law (sec. 4450, Rev. Stat.) into the conduct of the licensed officers of the steamer *Eastland* was, as my last report stated, adjourned pending the action of the Federal grand jury. It is not practicable to pursue the inquiry until action shall have been taken by the State courts under the indictments pending therein. Indictments were found by the Federal grand jury against two local inspectors of the Steamboat-Inspection Service, of this Department, located at Grand Haven, Mich. The Federal authorities sought an order of removal of these officers to the jurisdiction of the Federal court in northern Illinois. Meanwhile the two inspectors were suspended without pay, subject to reinstatement with accumulated pay in the event of their exoneration by the court. Argument for the order of removal was heard at length by Justice Sessions of the District Court of the United States for the Western District of Michigan, Southern Division. His decision, rendered February 18, 1916, exonerated the inspectors and denied the order for their removal. They were restored to duty with accumulated pay. When the courts shall have acted in the matter of the licensed officers, the suspended inquiry into their conduct by the local board of inspectors of Milwaukee will be concluded.

The legislation recommended by the board of inquiry in the statement printed in my last report was drafted and placed before Congress. It is treated in detail herein.

I again urge the importance of placing the Steamboat-Inspection Service on a scientific as well as upon a practical basis through the establishment of the board of naval architects which the *Eastland* board of inquiry recommended, or by such other action to a similar effect as will provide a scientific staff, now lacking.

Inadequate Motor-Boat Laws.

Repeatedly the Department has stated the dangers to life arising under the present inadequate motor-boat laws. Three times before the following statement has been published. It is renewed now because the facts can not be made too plain.

The Department has no direct power over a motor vessel either as regards passengers or machinery. It can inspect the hull, tanks, and piping, but only when the vessel is of 15 tons measurement or more, and when it carries passengers or freight for hire. If, for example, the motor vessel is a private vessel of over 15 tons measurement, the Department can not inspect her in any way. Even if she is a towing motor vessel of this size, there exists no lawful power to inspect her.

The Department can not limit the number of passengers carried for hire on a motor vessel, however big, except by fixing the life-saving equipment. Over motor vessels

smaller than 15 tons the powers of the Department are limited to seeing them provided with the necessary life-saving equipment, lights, life preservers, and means of extinguishing gasoline fires. Here the present powers of the Government stop.

I wish to make this perfectly plain. If a Government inspector stands upon a dock watching a motor boat sail away with three times as many passengers as she ought to have and her machinery defective and her hull leaking, he would have no power in the premises, were she a motor boat under 15 tons measurement, except to see that there was a life preserver in good order provided for every passenger on board, that she had the proper lights and the proper means of extinguishing gasoline fires, with a whistle and a bell of standard dimensions. He could, indeed, require such a vessel to have a licensed operator, but for that license no examination is required.

* * * At present a person may obtain a license as operator of motor vessels without being a citizen of the United States or without being 21 years of age, and while being unable to read or write. Under the law, licenses to operators of motor boats are issued without any examination whatever. Inspectors are without authority to ask whether the person applying for such motor-boat license is color blind or whether he understands or can read the pilot rules. Yet such persons, having a license so obtained, may, and in fact do, take charge of motor vessels carrying passengers for hire. Operators of motor boats should be required to show that they are not color blind and have good vision, that they can read the pilot rules and laws, and that they have a reasonable knowledge of them. *The existing conditions are a menace to the lives of innocent and unsuspecting passengers and should not be permitted to continue.*

For the FOURTH TIME the Department asks the authority which it now lacks to protect the lives of innocent passengers on motor vessels. Here and now it is pointed out that when the accident which is certain to happen if that authority is not given shall occur the responsibility for the loss of life will not rest with the Department.

Bills approved by the Department and by large motor-boat interests after a full discussion on the subject were introduced providing for the numbering and recording of undocumented vessels, for the licensing of operators of motor vessels after a written examination, and for a certificate of approval from the local inspectors of steam vessels, for all motor boats carrying 20 passengers or more for hire. Hearings were given on both measures, but the bills have not as yet been reported.

Another bill (H. R. 13831), to which reference is hereinafter made, gives the local inspectors of steam vessels power to regulate the number of passengers that may be carried on all inspected motor boats.

These measures will, if made law, do much to improve existing conditions.

Unprecedented Foreign Trade.

The balance of trade in favor of the United States on merchandise transactions for the fiscal year ended June 30, 1916, was \$2,135,775,355. The total of our merchandise export trade was

\$4,333,658,865 and of our import trade \$2,197,883,510. These conditions have increased during the three months from the close of the fiscal year to October 1, in which period the merchandise exports have been \$1,468,196,616, the imports \$546,187,765, and the net visible balance \$922,008,851.

Our foreign indebtedness has been reduced possibly 3 billions. We have loaned abroad a total sum since the war began on August 1, 1914, estimated at \$1,500,000,000, and increasing. We are the wealthiest nation in the world and the most prosperous one. We have not wasted our men or our means in war. Relatively to our fiscal power to-day our debts are trifling. Nations less wealthy than some of our individual States bear a heavier burden of debt and interest than we. We are the only one of the great industrial peoples that is at peace. Nations turn to us for goods and for means with which to pay us for the goods. None of us in our wildest financial fancies would five years ago have dreamed that things could be as now they are. To protect our reserve of gold, which is the ultimate base on which our domestic credits rest, we must maintain our export trade and must continue and increase loans and investments abroad. The work of the Bureau of Foreign and Domestic Commerce is devoted to these important duties. The report of the chief of that service shows its extraordinary expansion and effectiveness. In thousands of business offices its aid is acknowledged and welcomed. Never has our Government put at the disposal of our business and industry the helpful facilities that are now provided.

It is of national importance that the great service which shows such practical results should be given the men and the money necessary to carry on its great work even more efficiently. The force of commercial attachés should be enlarged. Further sums should be provided for the foreign traveling service, and the supervising and clerical staff should be made adequate to meet the demands of commerce. The Department acknowledges with keen appreciation the aid which Congress has given. The funds for promoting the foreign trade of the country are now five times larger than they were four years ago. The results are many times greater than the increase in funds. A comparison of present conditions with those that existed four years ago is like comparing life with death. Then there were no branch or cooperating offices of the commercial service. Now in one of the eight offices 2,900 men called in a single month for business assistance. Then there were no commercial

attachés and a smaller force of traveling agents. Now from 10 attachés and 22 commercial agents knowledge comes constantly which results in orders, the profits upon which, estimated on a low basis, exceed many times the total cost of the entire service which promotes them.

Government-Owned Building for the Department.

The act of May 30, 1908 (35 Stat., 545), authorized and directed the Secretary of the Treasury to acquire land for the use and accommodation of the Departments of State, Justice, and Commerce and Labor, and the Secretary of the Treasury has done so. The act of June 25, 1910 (36 Stat., 698), authorized and directed the Secretary of the Treasury to prepare designs and estimates for a separate fireproof building for each of the Departments of State, Justice, and Commerce and Labor, to be erected upon the land acquired under the act of May 30, 1908 (*supra*), at a cost not to exceed \$8,000,000. On March 3, 1913, the plans for the proposed building for the Department of *Commerce and Labor* were approved by my predecessor. These plans did not provide for the accommodation of the Bureau of Fisheries or the Coast and Geodetic Survey in the proposed new building. In view of the fact, however, that three bureaus which were to be housed in the proposed new building have been transferred to the Department of Labor and another bureau to the Federal Trade Commission, I am confident that the plans can be so revised that the building can accommodate the Coast and Geodetic Survey and the administrative offices of the Bureau of Fisheries.

As the lease for the Commerce Building, which the Department now occupies, will expire within two years, it will be necessary to proceed promptly in the matter of providing the new Government building for this Department if it is to be ready for occupancy by that time. The construction of such a building is urged not only in the interest of efficiency and good administration but also in the interest of economy. At the present time the Department is paying \$65,500 for the rental of the enlarged building, which, although reasonable when compared with other rental rates in the District of Columbia, represents an income of 3 per cent on \$2,183,333.

I have hitherto pointed out the desirability of having the bureaus of this Department, except the Bureau of Standards, housed in one Government building. The experience gained by having five of our bureaus housed in the same building with the

divisions of my own immediate office accentuates the loss of money and effectiveness in having the Bureau of Fisheries and the Coast and Geodetic Survey separated from the rest of the Department. It is never good business practice to scatter a department through several buildings located in different parts of the city. This is a cause of hourly waste, a producer of delays, and a creator of inefficiency. If poverty compels such a wasteful course to be pursued, it should at least be accepted only as a makeshift which common sense would end as soon as money could be found. I renew my protest against the policy of paying rent to private parties for buildings for the public service, especially when this requires the work of a department to be split into parts at enhanced cost for operation.

Development of New Fish Foods—Fisheries Laboratory and Aquarium.

The Bureau of Fisheries needs a practical working laboratory with an aquarium attached as a part thereof. This Service has introduced an entirely new food during the fiscal year in the tilefish. It was not known when the year began. Inquiry then in any fish market throughout the land would have failed to find one. The Fisheries Service began its work to develop the tilefish in October, 1915. By the beginning of November the fishery was actually begun. At the end of the fiscal year the fishery was eight months old. During that time 4,125,000 pounds of tilefish were sold, bringing to the fishermen over \$200,000 from a source theretofore unknown. In July, 1916, 2,200,000 additional pounds of tilefish were taken into New York, 230,000 pounds into Boston, and smaller loads into Atlantic City, Newport, and elsewhere. The average catch of this new food fish for recent months is at the rate of 20 million pounds (10,000 net tons) per annum. This subject is covered in detail under the Bureau of Fisheries herein.

What the Fisheries Service has done with the tilefish it is doing with the grayfish. Over 2,000 persons ate this new food at the Eastport, Me., fish fair in August, 1916, without a single unfavorable comment. A similar work, though on a smaller scale, has been done in introducing the wholesome sea mussel. These are practical attacks upon the high cost of living. It is hard to imagine a more practical contribution than to find and furnish a new and cheap food, and it is to develop this work on a larger scale that the laboratory and aquarium are needed. The aquarium would indeed have large educational value to the public interest.

in it appears in the throngs that visited the exhibit of the Bureau of Fisheries at the Panama-Pacific Exposition and in the urgency with which the request was pressed for the continued showing of that exhibit at San Diego. The small temporary aquaria of the Fisheries Service in Washington and in Woods Hole, Mass., delight a constant stream of visitors and the public aquaria in different cities witness to the same general interest. The purpose of the aquarium, however, would not be to furnish a place for amusement. It would be a working tool to provide new sources of food supply and to improve those now existing.

It is a singular thing that so practical a people as we talk so much about the cost of living and do so little about it. There are huge quantities and a large variety of unused fish foods of excellent quality of which we hardly know. An acre of water on a farm is equal to an acre of good land in food-producing value. We wisely establish agricultural experiment stations; why stop there? It is quite as possible to improve the breed of fishes in food value as it is to develop plants in like characteristics. What is true of plant life, of cattle and horses, as regards improving their quality and number is just as true of fishes, and the infinite variety of fishes far surpasses that of all other animals put together.

Three things are possible by the use of such an aquarium which without it will be long delayed. These are (1) new sources of food supplies; (2) the improvement of the food supplies now existing; and (3) the enlargement of the present supply.

A bill (H. R. 764) is now pending to provide a new building for the Bureau of Fisheries. An amendment has been suggested to make the bill provide "that the Secretary of Commerce be, and he is hereby, authorized to have prepared plans, specifications, and estimates of cost for the construction of a fireproof steel-frame building, to cost not to exceed seven hundred and fifty thousand dollars, for the use and accommodation of the Bureau of Fisheries, including aquarium and laboratory facilities and an experimental fish hatchery, to be erected, when appropriated for, on the north side of the Mall between Fourteenth and Fifteenth Streets; and there is hereby appropriated the sum of ten thousand dollars, or as much thereof as may be necessary, to carry into effect the provisions of this Act."

In my judgment the officers and clerical staff of the Bureau of Fisheries should be housed in a new Government building for the Department of Commerce, but the aquarium and its accompanying laboratories should be separately though conveniently located.

Safeguards Against Foreign Unfair Competition.

The recommendation in my report for last year that legislation be enacted providing safeguards against foreign unfair competition has been met by the passage of laws deemed adequate for that purpose. In that connection a revision of duties upon dyestuffs, made with the cooperation and approval of this Department, has also taken place. The two together provide a security, never before existing, for new industries necessary to our industrial independence. The recommendation in my annual report that business concerns should be allowed to cooperate in foreign trade has found result in the Webb bill, which has passed the House of Representatives and is now pending in the Senate. It is earnestly to be hoped that this will pass early in the coming session. It has the full approval of this Department. It is quite as essential for the support of our foreign trade as was the law against foreign unfair competition for our domestic trade. Both are far-seeing and wise safeguards for our business which can not be too soon provided.

I rejoice in the extension of American banks abroad and in the revision of the law which makes more easily possible the multiplying of such banks. I regard the extension of American investments abroad as a happy, indeed a necessary, thing for the business future of the country. With banks in foreign lands under American control and sympathetic with American commerce, with investments in foreign lands made by American capital and looking to America for purchases arising from their operations, with freedom for our producers to cooperate in the foreign field, we have three powerful tools long needed but never supplied until now. It is one thing to criticize and correct business evils. It is another and a happier thing to give to business a helping hand. It is well that the latter has come to be the prevailing practice.

Merchant Marine.

The American merchant marine, which is another great weapon needed for our foreign trade, has never before increased so fast as during the past two years. In that time we have doubled our shipping in the foreign trade—from 1,076,152 gross tons to 2,191,715 gross tons. No other nation ever in so short a time so increased its shipping in foreign trade. Under the Ship Registry Act admitting foreign-built ships to American registry for foreign trade, 182 vessels of 616,033 gross tons have been added to our

merchant marine. On July 1, 1915, our shipyards were building, or had under contract, 76 steel vessels of 310,089 gross tons. On October 1, 1916, this had grown to 417 steel merchant vessels of 1,454,270 gross tons. This does not include work in progress or under contract on wooden ships in many yards. The merchant shipbuilding thus in progress is not only the greatest in our own history but greater than any corresponding construction in the history of any other nation except Great Britain. It includes 195 ocean steel steamers of over 1,000 gross tons each, aggregating 1,037,103 gross tons.

Inspection of Foreign-Built Vessels Admitted to American Registry.

On August 31, 1916, a meeting was held in the office of the Acting Secretary, at which were present representatives of leading steamship companies of the United States, who desired to discuss the matter of inspecting the foreign-built vessels admitted to American registry, to which inspection they became subject on September 4, 1916, on the expiration of the term fixed by the President's proclamation admitting them to American registry. The matter was considered in all its phases and ended in the following Executive order, which was satisfactory to all concerned:

EXECUTIVE ORDER.

In pursuance of the authority conferred upon the President of the United States by Section 2 of the Act approved August 18, 1914, entitled "An Act to provide for the admission of foreign-built ships to American registry for the foreign trade, and for other purposes," it is hereby ordered:

1. That the provisions of the law prescribing that the watch officers of vessels of the United States registered for foreign trade shall be citizens of the United States, are hereby suspended so far and for such length of time as is herein provided, namely: All watch officers now employed on foreign-built ships which have been admitted to United States registry under said Act who, heretofore, have declared their intention to become citizens of the United States and watch officers on such ships who, within six months from this date, shall declare their intention to become such citizens shall be entitled to serve on foreign-built ships so registered until the time shall have expired within which they may become such citizens under their declarations, and shall be eligible for promotion upon any foreign-built ship so registered.

2. That the provisions of law requiring survey, inspection and measurement, by officers of the United States, of foreign-built ships admitted to United States registry under said Act are hereby suspended so far and for such length of time as is herein provided, namely: The said provisions shall not apply to any such foreign-built ship during the period of one year from this date provided the Secretary of Commerce is satisfied in the case of any such ship that the ship is safe and seaworthy and that proper effort is being made to comply with the said provisions.

WOODROW WILSON

THE WHITE HOUSE, 1 September, 1916.
[No. 2448.]

Passenger Allowance for Excursion Steamers.

Continued study is being given to the problem of better controlling the passenger allowance for excursion steamers. The experience of the Department shows that the pressure to carry heavy loads comes quite as strongly from the public themselves, who seem to take little or no account of the limit of the number of passengers fixed, as it does from the desire of vessel owners and officers to crowd their boats. The problem is to determine a rule of general application which will not too severely restrict the opportunities for outdoor recreation eagerly sought by a large portion of our people, while at the same time it will provide an economic basis on which the excursion steamers can continue to run.

The matter is complicated because a rule applying to one portion of the country does not necessarily hold in another, and a rule for sheltered waters is not suitable for those that are more exposed. At present the matter lies in the hands of the different local boards of inspectors, so that even with the utmost care on the part of supervising inspectors to promote uniformity it is possible to have vessels in one district permitted loads differing from those in an adjoining district.

The Steamboat-Inspection Service expects to be able to develop by study of the problem a solution which will be found generally applicable. In the meantime, as is stated under the heading of the Bureau of Navigation, exceptional care is being taken to prevent loads in excess of the existing limits and to make these last as safe and uniform as possible.

Protection of Vessels Against Fire.

On May 3, 1916, an advisory conference was held in the office of the Secretary on the subject of making passenger vessels more secure from destruction by fire. The object of this conference was to bring out the latest thought of the best informed men upon the subject. There were present 35 persons other than the officers of the Department, representing constructing, operating, labor, and manufacturing interests. A stenographic report was taken of the proceedings and the statements made by each person taking part in the discussions were referred to him for correction or enlargement. The amended papers were printed in a pamphlet embodying the entire proceedings which has been widely circulated and contains the best opinion on this important subject.

At the conference a committee was appointed under whose auspices a further conference was held at the Department on May 22,

1916, on the subject of automatic sprinklers on vessels. This was attended by representatives of manufacturing and insuring interests, and the proceedings were fully published together with correspondence on the subject in another pamphlet which was given general circulation among parties interested.

It is believed that valuable results have followed and will hereafter follow from the interchange of ideas and from the presentation of the best modern thought on these important themes in available form to those interested in them. The Bureau of Standards is studying the subject of fire-resisting materials for steamboats, and at its suggestion the committee above named has been requested to appoint a subcommittee to cooperate with the Bureau of Standards in the development of the subject.

Load-Line and Bulkhead Regulation.

With a similar purpose a conference was held in the office of the Secretary on September 27, 1916, on the important subjects of load lines and of bulkhead legislation. That conference was attended by 40 persons representing shipbuilding and operating interests as well as by officers of the Navy Department and those of the Department of Commerce. The persons attending came from many parts of the country. The following committee has been designated as a result of the conference. They will consider the questions of bulkheads and load lines and report later to me or to the Shipping Board when it shall have been formed: Stevenson Taylor, of New York, president of the American Bureau of Shipping and of the American Society of Naval Architects and Marine Engineers; H. C. Sadler, Ann Arbor, Mich., professor of naval architecture, University of Michigan; H. M. Herriman, Cleveland, Ohio; C. J. Olson, San Francisco, Cal.; H. H. Raymond, New York, manager Clyde and Mallory Steamship Cos.; T. M. Cornbrooks, Sparrows Point, Md., chief engineer and naval architect, Bethlehem Steel Co.'s Maryland shipbuilding plant; William Gatewood, Newport News, Va., naval architect, Newport News Shipbuilding & Dry Dock Co.; W. A. Dobson, naval architect, Philadelphia, William Cramp & Sons Ship & Engine Building Co.; and J. W. Powell, Quincy, Mass., president Fore River Shipbuilding Co.

The proceedings of the conference were reported fully and will be printed for general use after full opportunity for correction and enlargement as in the former case.

In my last report I pointed out that the number of American cargo steamers has increased so rapidly that the subject of load-line regulation ought not to be postponed and that if our cargo

ships are to connect in foreign trade with those of other nations and rules should be similar to those adopted by other countries. I earnestly hope that as the result of the conference a beginning at least has been made of such study of this question as will lead at no distant date to definite legislation upon it.

Copies of the publications mentioned in connection with both conferences will be furnished to the appropriate committees of Congress.

Appropriations and Expenditures.

The itemized statement of the disbursements from the contingent fund of the Department of Commerce and the appropriation for "General expenses, Bureau of Standards," for the fiscal year ended June 30, 1916, required to be submitted to Congress by section 115 of the Revised Statutes of the United States; the itemized statement of expenditures under all appropriations for propagation of food fishes during the fiscal year ended June 30, 1916, required by the act of Congress approved March 3, 1887 (24 Stat., 503), and a statement showing travel on official business by officers and employees (other than the special agents, inspectors, and employees who, in the discharge of their regular duties, are required to travel constantly) from Washington to points outside of the District of Columbia during the fiscal year ended June 30, 1916, as required by the act of Congress approved May 22, 1908 (35 Stat., 224), will be transmitted to Congress in the usual form.

The following table shows the total amounts of all appropriations for the various bureaus and services of the Department of Commerce for the fiscal year ended June 30, 1916:

Bureau.	Legislative act.	Smithsonian act.	Deficiency act.	Special act.	Total.
Office of the Secretary	\$899,910.00				\$899,910.00
Bureau of Lighthouses	29,950.00	\$5,000,000.00	\$200,000.00		5,329,900.00
Bureau of the Census	1,096,700.00		25.00		1,096,725.00
Bureau of Foreign and Domestic Commerce	479,210.00		2,000.00		481,210.00
Steamboat Inspection Service	524,240.00		20,000.00		544,240.00
Bureau of Navigation	219,730.00		2,100.00	\$5,000.00	226,830.00
Bureau of Standards	608,710.00	90,000.00	210,000.00		\$908,710.00
Bureau of Fisheries		1,095,500.00	7,100.00		1,102,600.00
Coast and Geodetic Survey		1,216,400.00	3,000.00		1,219,400.00
Total	3,324,810.00	7,105,500.00	399,100.00	5,000.00	10,834,410.00
Amount for printing and bind- ing		350,000.00			350,000.00
Grand total		\$7,455,500.00			11,189,910.00

The disbursements by the Disbursing Clerk of the Department of Commerce during the fiscal year ended June 30, 1916, arranged according to items of appropriation, are as follows:

OFFICE OF THE SECRETARY.

Salaries, Office of Secretary of Commerce, 1915.....	\$6, 409. 31
Salaries, Office of Secretary of Commerce, 1916.....	161, 684. 08
Contingent expenses, Department of Commerce, 1914.....	2. 31
Contingent expenses, Department of Commerce, 1915.....	17, 026. 83
Contingent expenses, Department of Commerce, 1916.....	86, 767. 10
Rent, Department of Commerce, 1915.....	5, 708. 33
Rent, Department of Commerce, 1916.....	60, 791. 64
Total.....	338, 389. 60

BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

Salaries, Bureau of Foreign and Domestic Commerce, 1915.....	5, 096. 03
Salaries, Bureau of Foreign and Domestic Commerce, 1916.....	113, 737. 82
Promoting commerce, Department of Commerce, 1914.....	. 75
Promoting commerce, Department of Commerce, 1915.....	6, 887. 08
Promoting commerce, Department of Commerce, 1916.....	48, 136. 33
Promoting commerce, South and Central America, 1915.....	1, 165. 99
Promoting commerce, South and Central America, 1916.....	33, 103. 45
Investigating cost of production, Department of Commerce, 1915.....	1, 979. 12
Investigating cost of production, Department of Commerce, 1916.....	44, 239. 28
Commercial attachés, Department of Commerce, 1915.....	4, 894. 44
Commercial attachés, Department of Commerce, 1916.....	3, 204. 45
Total.....	262, 444. 74

BUREAU OF STANDARDS.

Salaries, Bureau of Standards, 1915.....	12, 020. 37
Salaries, Bureau of Standards, 1916.....	271, 570. 47
Laboratory, Bureau of Standards.....	594. 75
Equipment, Bureau of Standards, 1914.....	335. 80
Equipment, Bureau of Standards, 1915.....	17, 245. 28
Equipment, Bureau of Standards, 1916.....	28, 824. 92
General expenses, Bureau of Standards, 1914.....	209. 84
General expenses, Bureau of Standards, 1915.....	3, 292. 00
General expenses, Bureau of Standards, 1916.....	20, 295. 81
Testing machines, Bureau of Standards, 1915.....	1, 539. 95
Testing machines, Bureau of Standards, 1916.....	26, 727. 42
Testing structural materials, Bureau of Standards, 1915.....	13, 498. 57
Testing structural materials, Bureau of Standards, 1916.....	90, 932. 41
Improvement and care of grounds, Bureau of Standards, 1915.....	356. 80
Improvement and care of grounds, Bureau of Standards, 1916.....	5, 117. 71
Refrigeration constants, Bureau of Standards, 1914.....	8. 86
Refrigeration constants, Bureau of Standards, 1915.....	1, 001. 44
Refrigeration constants, Bureau of Standards, 1916.....	13, 903. 43
Testing railroad scales, Bureau of Standards, 1914.....	2, 628. 64
Testing railroad scales, Bureau of Standards, 1915.....	21, 161. 13
Testing railroad scales, Bureau of Standards, 1916.....	24, 010. 68
Investigation of fire-resisting properties, Bureau of Standards, 1914....	316. 44
Investigation of fire-resisting properties, Bureau of Standards, 1915....	8, 968. 72

Investigation of fire-resisting properties, Bureau of Standards, 1916....	\$21,070. 64
High-potential investigations, Bureau of Standards, 1915.....	1,753. 65
High-potential investigations, Bureau of Standards, 1916.....	13,647. 09
Testing miscellaneous materials, Bureau of Standards, 1915.....	1,205. 09
Testing miscellaneous materials, Bureau of Standards, 1916.....	17,401. 06
Investigation of railway materials, Bureau of Standards, 1915.....	4,381. 13
Investigation of railway materials, Bureau of Standards, 1916.....	11,494. 70
Investigation of public-utility standards, Bureau of Standards, 1915...	6,390. 68
Investigation of public-utility standards, Bureau of Standards, 1916...	22,949. 31
Equipping chemical laboratory building, Bureau of Standards, 1916-17.	60. 92
Workshop and storehouse, Bureau of Standards.....	272. 11
Chemical laboratory, Bureau of Standards.....	107,779. 89
Current-meter testing tank, Bureau of Standards, 1916.....	2,998. 34
Radio research, Bureau of Standards, 1916.....	7,709. 58
Heating system, north laboratory, Bureau of Standards, 1916.....	2,095. 35
Total.....	<u>785,770. 98</u>

BUREAU OF NAVIGATION.

Salaries, Bureau of Navigation, 1915.....	1,386. 71
Salaries, Bureau of Navigation, 1916.....	31,777. 71
Salaries, Shipping Service, 1915.....	2,459. 19
Salaries, Shipping Service, 1916.....	24,646. 31
Clerk hire, Shipping Service, 1915.....	2,862. 02
Clerk hire, Shipping Service, 1916.....	32,213. 58
Contingent expenses, Shipping Service, 1915.....	806. 68
Contingent expenses, Shipping Service, 1916.....	4,619. 94
Enforcement of navigation laws, 1914.....	8. 00
Enforcement of navigation laws, 1915.....	905. 83
Enforcement of navigation laws, 1916.....	22,264. 94
Enforcement of wireless-communication laws, 1914.....	16. 04
Enforcement of wireless-communication laws, 1915.....	2,365. 06
Enforcement of wireless-communication laws, 1916.....	39,601. 71
Admeasurement of vessels, 1915.....	166. 47
Admeasurement of vessels, 1916.....	2,341. 95
Preventing overcrowding of passenger vessels, 1915.....	4,219. 58
Preventing overcrowding of passenger vessels, 1916.....	14,116. 97
Instruments for counting passengers, 1915.....	6. 27
Total.....	<u>186,784. 96</u>

STEAMBOAT-INSPECTION SERVICE.

Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1915.....	647. 53
Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1916.....	14,767. 48
Salaries, Steamboat-Inspection Service, 1915.....	29,066. 20
Salaries, Steamboat-Inspection Service, 1916.....	326,264. 99
Clerk hire, Steamboat-Inspection Service, 1915.....	6,868. 41
Clerk hire, Steamboat-Inspection Service, 1916.....	76,987. 00
Contingent expenses, Steamboat-Inspection Service, 1914.....	. 35
Contingent expenses, Steamboat-Inspection Service, 1915.....	9,477. 47
Contingent expenses, Steamboat-Inspection Service, 1916.....	83,210. 52
Total.....	<u>547,289. 95</u>

BUREAU OF FISHERIES.

Salaries, Bureau of Fisheries, 1915.....	\$27,068. 19
Salaries, Bureau of Fisheries, 1916.....	352,627. 98
Miscellaneous expenses, Bureau of Fisheries, 1914.....	26. 81
Miscellaneous expenses, Bureau of Fisheries, 1915.....	49,572. 71
Miscellaneous expenses, Bureau of Fisheries, 1916.....	386,165. 81
Protecting seal and salmon fisheries of Alaska, 1915.....	15,474. 51
Protecting seal and salmon fisheries of Alaska, 1916.....	54,845. 13
Payment to Great Britain and Japan under Art. XI of Fur-Seals Convention of 1911.....	20,000. 00
Vessels and boats, Alaska fishery service, 1915.....	6,854. 00
Marine biological station, Florida.....	6,020. 10
Marine biological station, North Carolina, 1915.....	114. 86
Vessels, fish hatchery, Boothbay Harbor, Me., 1915-16.....	469. 35
Distribution cars, Bureau of Fisheries, 1915-16.....	19,193. 00
Fish hatcheries:	
Cape Vincent, N. Y.....	6,901. 38
Clackamas, Ore.....	2,740. 10
Cold Spring, Ga.....	5,000. 00
Edenton, N. C., 1915.....	2,888. 96
Kentucky.....	14,459. 35
Rhode Island.....	76. 60
South Carolina.....	8,345. 71
Upper Mississippi River Valley.....	764. 49
Utah.....	11,183. 62
Washington.....	3,249. 46
Woods Hole, Mass., 1915.....	16,284. 80
Wyoming.....	31,862. 52
Cold-storage plant, fur-seal islands, Alaska, 1915-16.....	349. 63
Total.....	<u>1,042,539. 07</u>

BUREAU OF THE CENSUS.

Salaries, Bureau of the Census, 1915.....	28,146. 85
Salaries, Bureau of the Census, 1916.....	636,968. 68
Collecting statistics, Bureau of the Census, 1914.....	12. 85
Collecting statistics, Bureau of the Census, 1915.....	63,079. 74
Collecting statistics, Bureau of the Census, 1915-16.....	148,589. 66
Collecting statistics, Bureau of the Census, 1916.....	353,303. 18
Tabulating machines, Bureau of the Census, 1915.....	766. 51
Tabulating machines, Bureau of the Census, 1916.....	10,364. 88
Total.....	<u>1,241,232. 35</u>

BUREAU OF LIGHTHOUSES.

Salaries, Bureau of Lighthouses, 1915.....	2,804. 65
Salaries, Bureau of Lighthouses, 1916.....	60,605. 50
General expenses, Lighthouse Service, 1914.....	493. 30
General expenses, Lighthouse Service, 1915.....	48,837. 14
General expenses, Lighthouse Service, 1916.....	63,073. 64
Salaries, Lighthouse Service, 1915.....	281. 25
Salaries, Lighthouse Service, 1916.....	11,356. 42
Salaries, lighthouse vessels, 1915.....	42. 20

Salaries, lighthouse vessels, 1916.....	\$13,758. 17
Salaries, keepers of lighthouses, 1914.....	14. 67
Salaries, keepers of lighthouses, 1916.....	22,215. 99
Aids to navigation:	
Alaska.....	290. 09
Atchafalaya Entrance, La.....	7. 44
Ashtabula Harbor, Ohio.....	17. 50
Manistique, Mich.....	44. 66
Puget Sound, Wash.....	385. 96
Lorain Harbor, Ohio.....	6. 46
Cape Cod Canal lights, Mass.....	135. 87
Fort McHenry Channel range lights, Md.....	437. 20
Point Judith Breakwater lights, R. I.....	. 73
Cape St. Elias Light Station, Alaska.....	7,329. 95
Navassa Island Light Station, West Indies.....	8,249. 30
Stonington Light Station, Conn.....	6. 74
Thimble Shoal Light Station, Va.....	3. 30
Galveston Jetty Light Station, Tex.....	36. 09
Tender for first lighthouse district.....	86,680. 51
Tender for fifteenth lighthouse district.....	9,811. 02
Tender for engineer, sixth lighthouse district.....	211. 96
Lighthouse tender, general service.....	105,643. 58
Point Abino Light Vessel, Lake Erie.....	8,894. 50
Southwest Pass Light Vessel, Mississippi River, La.....	59,743. 79
Light vessels for general service.....	64,385. 86
Lighting Norfolk Harbor, Va.....	32. 33
Repairing and rebuilding, aids to navigation, Gulf of Mexico.....	135. 29
Cleveland Fog-Signal Station, Ohio.....	12. 87
Total.....	575,985. 93
Grand total.....	4,980,437. 58

The following statement shows the expenditures during the fiscal year ended June 30, 1916, on account of all appropriations under the control of the Department, giving the total amounts disbursed by the various disbursing officers of the Department and miscellaneous receipts for the same period:

By the Disbursing Clerk, Department of Commerce, on account of salaries and expenses of the Office of the Secretary of Commerce, the Bureaus of Foreign and Domestic Commerce, Navigation, Standards, Fisheries, and Lighthouses, the Office of the Supervising Inspector General, Steamboat-Inspection Service, salaries and expenses of Steamboat-Inspection Service at large, and public works of the Lighthouse and Fisheries Services (shown in detail in the foregoing table of disbursements).....	\$4,980,437. 58
By the authorized disbursing officers of the Lighthouse Service.....	5,051,414. 82
By the special disbursing agent, Coast and Geodetic Survey, on account of salaries and expenses of the Coast and Geodetic Survey.....	1,142,632. 96
By the commercial agents of the Department investigating trade conditions abroad, as special disbursing agents.....	142,053. 98
By special disbursing agents, Bureau of Fisheries.....	34,331. 20

By warrants drawn on the Treasurer of the United States to satisfy accounts settled by the Auditor for the State and Other Departments, classified as follows:

Office of the Secretary	\$404. 28	
Bureau of the Census	1, 028. 12	
Bureau of Foreign and Domestic Commerce	686. 76	
Bureau of Lighthouses	75, 104. 58	
Steamboat-Inspection Service	7. 45	
Bureau of Navigation	5, 442. 59	
Bureau of Fisheries	18, 639. 97	
Bureau of Standards	3, 272. 90	
Coast and Geodetic Survey	24, 045. 26	
		\$128, 631. 91
Printing and binding		389, 805. 78
Total		11, 869, 308. 23

MISCELLANEOUS RECEIPTS, FISCAL YEAR 1916.

Coast and Geodetic Survey: Sale of charts, publications, old property, etc.	\$24, 692. 40
Bureau of the Census: Sale of publications, etc.	363. 00
Bureau of Fisheries:	
Sale of fox skins	56, 396. 83
Sale of furs	781. 42
Sale of old property, etc.	4, 468. 09
Bureau of Foreign and Domestic Commerce: Sale of old property, etc. .	72. 11
Bureau of Navigation:	
Sale of old property	3. 97
Annual yacht tax	19, 849. 71
Tonnage tax	1, 454, 565. 83
Navigation fees	158, 518. 08
Navigation fines	52, 381. 75
From deceased passengers	220. 00
Bureau of Lighthouses: Sale of public property, rentals, etc.	35, 608. 09
Bureau of Standards: Standardizing and testing weights, etc.	13, 857. 82
Office of the Secretary: Sale of condemned property, etc.	829. 57
Total	1, 822, 608. 67

The following unexpended balances of appropriations were turned into the surplus fund June 30, 1916, in accordance with the act of June 20, 1874 (18 Stat., 110-111):

Office of the Secretary:	
Salaries, Office of the Secretary of Commerce, 1914	\$1, 320. 04
Contingent expenses, Department of Commerce, 1914	726. 01
Bureau of the Census:	
Salaries, Bureau of the Census, 1914	18, 197. 04
Collecting statistics, Bureau of the Census, 1914	20, 037. 57
Rent, Bureau of the Census, 1914	1, 080. 00
Tabulating machines, Bureau of the Census, 1914	1, 606. 43
Bureau of Foreign and Domestic Commerce:	
Salaries, Bureau of Foreign and Domestic Commerce, 1914	1, 714. 45
Salaries and expenses, commercial agents, Department of Commerce and Labor, 1911	8. 28

Item	Estimates, 1918.	Appropriation, 1917.	Income.
LIGHTHOUSE SERVICE—continued.			
Public works—Continued.			
Point Barrow, P. R., light station.....	\$85,000		
Light keepers' dwellings.....	75,000		
Chicago Harbor, Ill., light station.....	88,000		
Pairport, Ohio, aids to navigation.....	41,000		
Sand Hills, Mich., light station.....	75,000		
Manitowish Breakwater, Wis., light station.....	21,000		
East River, N. Y., aids to navigation.....	16,000		
Keweenaw Waterway, Mich., aids to navigation.....	120,000		
Cape Charles City, Va., aids to navigation.....	12,000		
Chesapeake Bay, Md. and Va., aids to navigation.....	29,000		
Aids to navigation, Alaska.....	60,000		
Indiana Harbor, Ind., aids to navigation.....	200,000		
Great Salt Pond, R. I., light station.....	25,000		
Radio installations on lighthouse tenders.....	60,000		
Washington and Oregon, aids to navigation.....	35,000		
Gulf coast, La., light vessel.....	260,000		
Sand Island, Ala., light station.....	45,000		
Spectacle Reef, Mich., light station.....	18,000		
Depot for fifth lighthouse district.....	275,000		
Tender for third lighthouse district.....	120,000		
Tender for fifth lighthouse district.....	120,000		
Intercommunication.....	100,000		
Point Vicente Light Station, Cal.....		\$80,000	
Aids to navigation, St. Johns River, Fla.....		66,000	
Woods Hole Lighthouse Depot, Mass.....		50,000	
Aids to navigation, Fighting Island Channel, Detroit River, Mich.....		25,000	
Aids to navigation, Florida Reefs, Fla.....		75,000	
Aids to navigation, Hudson River, N. Y.....		100,000	
Aids to navigation, Mississippi River, La.....		50,000	
Aids to navigation, Conneaut Harbor, Ohio.....		63,500	
Kellett Bluff Light Station, Wash.....		40,000	
Aids to navigation, Coquille River, Oreg.....		6,000	
Aids to navigation, Toledo Harbor, Ohio.....		15,000	
Dog Island Light, Me.....		3,500	
Aids to navigation, Delaware River, Pa. and Del.....		20,000	
Tender and barge for eighth lighthouse district.....		20,000	
Repairing and rebuilding aids to navigation, Gulf of Mexico.....		125,000	
Total.....	8,082,930	6,038,030	\$2,044,900
BUREAU OF THE CENSUS.			
Salaries.....	683,060	673,460	
Collecting statistics.....	647,000	512,000	
Tabulating machines.....	30,000	25,000	
Development of integrating counter.....	50,000		
Total.....	1,410,060	1,210,460	199,600
BUREAU OF FOREIGN AND DOMESTIC COMMERCE.			
Salaries.....	230,290	130,640	
Promoting commerce.....	250,000	125,000	
Commercial attachés.....		100,000	

Item.	Estimates, 1918.	Appropriation, 1917.	Increase.
BUREAU OF FOREIGN AND DOMESTIC COMMERCE—continued.			
Promoting commerce, North, South, and Central America, including Mexico, Cuba, and West Indies.....	\$150,000	\$100,000	
Investigating cost of production.....		50,000	
Total.....	855,290	505,640	\$349,650
STEAMBOAT-INSPECTION SERVICE.			
Salaries, Office of Supervising Inspector General.....	21,640	16,440	
Salaries, Steamboat-Inspection Service.....	445,700	412,100	
Clerk hire.....	96,800	84,000	
Contingent expenses.....	130,000	100,000	
Total.....	694,140	612,540	81,600
BUREAU OF NAVIGATION.			
Salaries.....	41,180	37,780	
Salaries, Shipping Service.....	32,200	28,600	
Clerk hire, Shipping Service.....	48,300	38,400	
Contingent expenses, Shipping Service.....	10,300	6,300	
Admeasurement of vessels.....	3,500	3,000	
Instruments for counting passengers.....	250	250	
Enforcement of navigation laws.....	42,000	24,000	
Preventing overcrowding of passenger vessels.....	18,000	18,000	
Enforcement of wireless communication laws.....	57,000	45,000	
Total.....	252,730	201,330	51,400
BUREAU OF STANDARDS.			
Salaries.....	438,400	311,720	
Equipment.....	60,000	50,000	
Repairs and alterations.....	5,000	5,000	
General expenses.....	35,000	28,500	
Improvement and care of grounds.....	6,000	6,000	
High potential investigations.....	15,000	15,000	
Testing structural materials.....	150,000	100,000	
Testing machines.....	30,000	30,000	
Investigation of fire-resisting properties.....	60,000	25,000	
Investigation of public-utility standards.....	100,000	40,000	
Investigation of railway materials.....	15,000	15,000	
Testing miscellaneous materials.....	25,000	20,000	
Radio communication.....	10,000	10,000	
Color standards.....	10,000	10,000	
Investigation of clay products.....	10,000	10,000	
Determining physical constants.....	25,000	5,000	
Standardization and testing of mechanical appliances.....	25,000	10,000	
Testing railroad scales.....	40,000	40,000	
Radio laboratory.....		50,000	
Investigation of textiles, paper, leather, and rubber.....	15,000		
Standard materials.....	4,000		
Radium standardization.....	20,000		
Testing machine.....	25,000		
Site for testing laboratory.....	50,000		
Fireproof building for testing laboratory.....	25,000		
Investigation of optical glass.....	10,000		
Investigation of the electrodeposition of metals.....	10,000		

Item.	Estimates, 1918.	Appropriation, 1917.	Increase.
BUREAU OF STANDARDS—continued.			
Research fellowships.....	\$15,000		
Additional land.....	25,000		
Refrigeration constants.....		\$15,000	
Total.....	1,258,400	795,000	\$463,400
BUREAU OF FISHERIES.			
Salaries.....	489,560	497,150	
Fish hatcheries:			
Bosman, Mont.....	15,000		
Cape Vincent, N. Y.....	15,000		
Duluth, Minn.....	3,000	2,000	
Edenton, N. C.....	3,300		
Northville, Mich.....	3,000		
Orangetown, S. C.....	6,000		
San Marcos, Tex.....	15,000		
Saratoga, Wyo.....	7,000		
Woods Hole, Mass.....	5,000		
Motor vessel to replace launch Blue Wing.....	6,000		
Yes Bay, Alaska.....	25,000		
Motor launches at Yes Bay and Alognak.....	20,000		
Vessel for use in waters of southeastern Alaska.....	50,000		
Diffusion of fishery information.....	20,000		
Gloucester, Mass.....		3,000	
Miscellaneous expenses.....	577,000	508,300	
Protecting seal and salmon fisheries of Alaska.....	100,000	75,000	
Payments to Great Britain and Japan.....	20,000	20,000	
Distribution cars.....	15,000	40,000	
Lobster-rearing plant.....		5,000	
Marine Biological Station, Fla.....		25,000	
Motor launches, Alaska fisheries service.....		20,000	
Buildings and improvements, fur-seal islands, Alaska.....		20,000	
Investigating damages to fisheries.....		25,000	
Total.....	1,370,060	1,154,850	\$215,210
COAST AND GEODETIC SURVEY.			
Party expenses.....	594,338	425,120	
Repairs of vessels.....	56,000	56,000	
Pay, etc., officers and men, vessels.....	337,500	285,000	
Salaries.....	571,540	398,120	
General expenses.....	72,500	62,500	
Lithographic presses.....	15,500		
Paper-cutting machine.....	1,600		
Fire protection.....	1,000		
Waterproofing vaults.....	2,500		
New vessels.....	833,000		
Total.....	2,485,478	1,227,140	1,258,338
PRINTING AND BINDING.			
Printing and binding.....	450,000	400,000	50,000
Grand total.....	17,164,158	12,449,050	4,735,108

Personnel.

The number of the personnel of the Department has been changed but little during the past fiscal year. There has been a slight accretion, amounting to less than three-tenths of 1 per cent, though the work and activities of the Department have been considerably augmented.

The accompanying table shows, by bureaus, the number of permanent positions in the Department on July 1, 1916, and the increase or decrease in each bureau as compared with July 1, 1915. The figures do not include temporary appointments, nor do they include the following appointments or employments not made by the head of the Department: Persons engaged in rodding, chaining, recording, heliotroping, etc., in field parties of the Coast and Geodetic Survey; temporary employments in field operations of the Bureau of Fisheries; mechanics, skilled tradesmen, and laborers employed under authority of Schedule A, Subdivision I, section 12, of the civil-service rules in the Lighthouse Service. Enlisted men on vessels of the Coast Survey in the Philippine Islands and officers and men of the Navy Department employed on vessels of the Bureau of Fisheries are also excluded. The total of these excluded miscellaneous employments and enlistments is approximately 5,886. At the close of the fiscal year there were 486 employees in the service of the Department serving under temporary appointment or employment.

Bureau.	Statutory.	Non-statutory.	Total.	In District of Columbia.	Outside District of Columbia.	Increase (+) or decrease (—)
Office of the Secretary.....	171	.....	171	171	.....	+ 9
Bureau of the Census.....	562	698	1,260	^a 592	^b 668	—19
Bureau of Foreign and Domestic Commerce.....	97	101	198	120	78	+27
Bureau of Standards.....	252	171	423	369	54	+39
Bureau of Fisheries.....	413	21	434	80	354	+15
Bureau of Lighthouses.....	56	5,642	^c 5,698	40	5,658	—94
Coast and Geodetic Survey.....	265	505	770	^a 280	490	+27
Bureau of Navigation.....	^d 43	118	161	34	127	— 8
Steamboat-Inspection Service.....	233	69	302	11	291	+32
Total.....	2,092	7,325	9,417	1,697	7,720	+28

^a Employees engaged in work in the field for a part of each year, with headquarters in Washington, are treated as within the District of Columbia.

^b Does not include 36 temporary special agents employed in connection with the census of vital statistics, statistics of cities, etc.

^c Includes the following positions, appointment to which is not made by the head of the Department: 533 (254 classified competitive and 279 classified excepted) mechanics, skilled tradesmen, and laborers employed in field construction work in the Lighthouse Service and work of a similar character at the general lighthouse depot at Tompkinsville, N. Y., 1,522 (unclassified) laborers in charge of post lights, and 1,179 (unclassified) members of crews of vessels.

^d Includes 2 stenographers and typewriters authorized by law not exceeding six months.

The following tables give a summary of changes in the personnel of the Department for the fiscal year ended June 30, 1916:

APPOINTMENTS, PROMOTIONS, AND REDUCTIONS.

Bureau.	Appointments. ^a						Promo- tions.	Reduc- tions.
	Permanent.				Tempo- rary.	Grand total.		
	Com- peti- tive.	Ex- cepted.	Un- classi- fied.	Total.				
Office of the Secretary.....	40		8	48	5	53	20	2
Bureau of the Census.....	45		142	187	176	363	76	6
Bureau of Foreign and Domestic Commerce.....	28	24		52	108	154	43	9
Bureau of Standards.....	81		5	86	53	139	138	
Bureau of Fisheries.....	52	11	14	77	18	95	36	6
Bureau of Lighthouses.....	225	49		274	95	369	852	91
Coast and Geodetic Survey.....	38	2	2	42	12	54	144	5
Bureau of Navigation.....	17	7	2	26	30	56	40	
Steamboat-Inspection Service.....	31			31	11	43	27	2
Total.....	558	93	173	824	502	1,326	1,376	122

SEPARATIONS AND MISCELLANEOUS CHANGES.

Bureau.	Separations. ^b						Miscellaneous changes. ^c
	From permanent positions.				From temporary positions.	Grand total.	
	Competitive.	Excepted.	Unclassified.	Total.			
Office of the Secretary.....	19		3	22	5	27	10
Bureau of the Census.....	50		145	195	768	963	50
Bureau of Foreign and Domestic Commerce.....	11	17		28	85	113	65
Bureau of Standards.....	75		2	77	43	120	41
Bureau of Fisheries.....	37	8	15	60	11	71	25
Bureau of Lighthouses.....	246	51		297	79	376	78
Coast and Geodetic Survey.....	29	4		33	20	53	7
Bureau of Navigation.....	15	2	1	18	35	53	23
Steamboat-Inspection Service.....	24		1	25	8	33	4
Total.....	506	82	167	755	1,054	1,809	303

^a Includes appointments of the following character: Presidential, by selection from civil-service certificates, under Executive order, to excepted positions, by reinstatement, and by reason of transfer within the Department or from other departments or independent establishments.

^b Includes separations by reason of resignations, discontinuances, removals, deaths, transfers within the Department, and transfers from the Department to other departments or independent establishments.

^c Includes reappointments by reason of change of station, name, designation, or appropriation, extensions of temporary appointments, changes from temporary to permanent status, etc.

Among the 26 presidential positions in the Department there have been three changes, the vacancy in each case having been caused by resignation and filled by recess appointment, which

the President issued upon recommendation of the Department, and the appointees having been later nominated to and confirmed by the Senate. The Superintendent of the Coast and Geodetic Survey was commissioned under recess appointment March 11, 1915, confirmed by the Senate on December 16, 1915, and permanently commissioned December 18, 1915. The Deputy Commissioner of Fisheries was commissioned under recess appointment March 11, 1915, confirmed by the Senate February 7, 1916, and permanently commissioned February 10, 1916. The supervising inspector, third district, Steamboat-Inspection Service, was commissioned under recess appointment September 17, 1915, confirmed by the Senate on December 16, 1915, and permanently commissioned December 18, 1915.

It is the Department's definite policy, which in the final analysis acts favorably upon its work as a whole, to afford its employees every possible means of advancement within its own limits, and it is the general practice, publicly announced and well understood, not to fill vacancies in the higher grades by transfer from other branches of the service so long as there are any employees of its own who are eligible and capable of performing well the duties of the higher positions. In carrying out this policy the Department has expressed the desire that a knowledge of the operations of the various bureaus and offices be extended as broadly as possible among the entire staff of employees so as to encourage the junior members of the force to learn the work in all its forms and to endeavor to develop their natural abilities so as to become adequately equipped for the proper performance of the duties of the higher grade positions which may become vacant.

A study of the leave records of the employees of the Department for the calendar year 1915 indicates that the leave privilege is being exercised generally in a considerate manner. There is evidence of a desire to subserve personal convenience to the demands of the service, and of a spirit of self-sacrifice both as to leave and necessary overtime work that is most praiseworthy.

The following statement shows the extent to which leave was utilized during the calendar year 1915:

	Male.	Female.	All employees.
	<i>Days.</i>	<i>Days.</i>	<i>Days.</i>
Average annual leave taken.....	27.64	29.47	28.09
Average sick leave taken.....	5.87	10.16	6.91
Average total leave taken.....	33.51	39.63	35.00

One of the bureaus of the Department shows the remarkable record of having used during the year an average of less than one day of sick leave per employee.

In June, 1916, the National Guard of the District of Columbia and the Organized Militia of the several States were called out for duty in connection with the unsettled conditions in Mexico. Those employees of the Department who were members of such organizations and had not been discharged therefrom were granted 30 days of annual leave, and at the expiration of such leave their services were discontinued without prejudice, with the understanding that applications for reinstatement at the expiration of their military service will be given favorable consideration. Up to the close of July 31, 1916, the Department had discontinued the services of 18 such employees. It is the declared policy of the Department to give every proper privilege to those of its employees who have so readily responded to the call of the Government.

That the efficiency of the executive civil service is seriously impaired by reason of its superannuated employees, and that the prompt enactment of some equitable form of retirement law is one of its greatest needs, are facts conceded by practically all persons who are at all familiar with the problems of the service. Efficient service and justice to employees demand a comprehensive, wide-reaching, and effective scheme of retirement pensions, the advantage of which is being more and more widely recognized by progressive commercial establishments and by foreign governments. While doubtless the cost of a civil-service retirement scheme would for a few years add to the expense of administration, it would be a good investment, and in a short time the service would be recouped the additional outlay many times over by the saving it would render possible. The standard of efficiency would be raised, the work could be done with less force, and this would be accomplished without heartlessly throwing out of employment men and women who for decades have given their best service to the Government and who have no means of subsistence other than their decreasing salaries.

The efficiency of the service could be materially increased by a general reclassification of positions and readjustment of salaries. The duties required in a given position should be the measure of compensation attached to it, but such is not always the case under the present classification. The lack of uniformity in salaries of positions requiring practically the same qualifications

does not work to the benefit of the service. The service is embarrassed at times by the number of declinations of appointment received and resignations in the lower grade positions. It is believed that among other things the establishment of a standard minimum rate of compensation for all clerical positions would have a beneficial effect upon the service. A better qualified class of persons would be attracted to these positions and the resignations would be less numerous. Material increases in the wage scale have been made in recent years in practically all lines of work in the commercial world. This renders it more difficult for the Government to obtain persons of the type and qualifications desired for certain classes of positions. While increases in many cases are desirable, it is not believed that a horizontal increase all along the line would solve the problem. It certainly would not be equitable, for the salaries of some positions are relatively much less than in others. Before there is any general increase in salaries there should be a thorough reclassification of positions and readjustment of salaries so that existing inequalities would be eliminated.

I have already conveyed to you my approval of the suggestion that the Saturday half holiday be continued throughout the year. I urge that this be done. The best industrial opinion has ceased to estimate the productive value of employees by a mathematical statement of the total number of hours worked. The productivity of human beings can not be confined within mathematical limits. The forces which control the productivity of men and women are not such as can be stated in figures. The responsiveness to leadership, the appreciation of just and considerate treatment, the energy which comes with freedom from fatigue—these are greater forces than the arbitrary number of hours of labor.

In a working force which has such a record as regards the taking of leave and overtime as that of this Department I believe it is beyond all question true that the granting of the Saturday half holiday would result in greater and not less production and in better rather than worse work.

The following compilation has interest in connection with the facts relating to the cost of living of Government employees in Washington. The present scale of wages for clerks in the Government service, grouping them into four classes and fixing a salary of \$1,800, \$1,600, \$1,400, and \$1,200, respectively, per annum, for each of these classes, was fixed by the act of Congress approved April 22, 1854 (10 Stat., 276; sec. 167, Rev. Stat.), and has not been changed since that time. For the subclerical grades

the rates of compensation were fixed by the acts of Congress approved July 23, 1866 (14 Stat., 207; sec. 167, Rev. Stat.), and July 12, 1870 (16 Stat., 250; sec. 167, Rev. Stat.).

For 60 years the rates of compensation to clerks have remained stationary, and for about 46 years to the subclerical grades. The available figures on file in the Bureau of Labor Statistics, based upon wages in selected industries, all of which, however, were not uniform for the entire period covered, but which can be accepted as typical, show an increase in daily average wage of 137.4 per cent from 1854 to 1915. In other words, daily wages in 1915 were $2\frac{1}{3}$ times as much as in 1854. These figures were taken from Senate Report No. 1394, Fifty-second Congress, second session, Report of Senate Finance Committee on Wholesale Prices, Wages, and Transportation, which, on page 176, gives the average wage increase to 1891; Bulletin No. 77 of the Bureau of Labor Statistics, which, on page 7, gives the average wage scale from 1891 to 1907; and Bulletin No. 194 of the Bureau of Labor Statistics, which, on page 20, gives the average wage scale from 1907 to 1915. The reports on cost of living show that for the same period, 1854 to 1915, the increase has been 14.1 per cent. These figures are based on wholesale prices, and it is a fair assumption that the retail-price increases will very closely approximate those of the wholesale-price increases. Bringing the price figures up to the latest date for which they are available, the month of September, 1916, by using figures relating to retail prices of food, the increase over 1854 is 32.4 per cent. In other words, the increase from the average for 1915, to September 15, 1916, in price of food commodities as a group is greater than the increase of the average price for the whole period from 1854 to 1915. The increase during the nine months ended September 15, 1916, over the average price for the year 1915 is approximately 16 per cent.

For the last few years the figures showing wage increases are based on the union wage scale. It is a well-known fact that in many industries to-day wages in excess of the union scale are being paid.

Interesting in connection with this study are some pertinent figures shown by the General Review of Crop Conditions on October 1, 1916, issued by the Bureau of Crop Estimates of the Department of Agriculture. From this report it appears that the index figure of prices paid to the producers of the United States for principal crops on October 1, 1916, is about 27.6 per cent higher than a year ago, 19.9 per cent higher than two years ago, and 23.8 per cent higher than the average of n years on

the same date. This report also shows that the corn crop is estimated to be 11 per cent below the yield of last year; wheat, 40 per cent; oats, 20 per cent; barley, 22 per cent; rye, 15 per cent; white potatoes, 16 per cent; and apples, 14 per cent. The index figures of meat animals on September 15, 1916, show prices paid to producers of about 23.7 per cent higher than the figures of a year ago; 10.5 per cent higher than two years ago; and 22.5 per cent higher than the average of the last six years on the same date. All these facts point to a still higher charge for food supplies.

Rather startling are the figures compiled by the Bureau of Labor Statistics relative to wheat and flour for the period from May to September, 1916. The report on this subject shows that the average retail price of flour increased from \$7.62 per barrel in May, 1916, to \$9.39 per barrel in September, 1916, and press reports since that time indicate that the retail price of flour has gone to \$12 per barrel.

From the above statements it clearly appears that wages in all branches of industries have more than kept pace with the increased cost of living, but that no increase has been made in the wage scale of Government employees, notwithstanding the fact that since 1854 the daily task of all wage earners has been steadily decreasing, while the Government employee has received increased hours, with no consequent increase in compensation to offset, in a measure, the increased living cost.

That living costs in the last few years have gone up to an unprecedented extent is not shown by governmental reports alone. The *Annalist* states that in the year ended September 30, 1916, the increase in a selected group of commodities, arranged to represent a theoretical family's food budget, has gone from 135 to 185, or an increase of about 37 per cent. The percentage of increase in food commodities shown by the *Annalist* compares with the official figures of the Bureau of Labor Statistics compiled to June 30, 1916.

Printing and Binding.

The sundry civil act approved March 3, 1915, allotted to the Department \$390,000 for printing and binding during the fiscal year 1916. Of this allotment \$389,805.78 was expended, leaving an unused balance on June 30 of \$194.22. The decrease in expenditures for printing and binding in 1916 compared with 1915 was \$10,193.69 (or 2.55 per cent), the allotment in 1915 being \$400,000 and the expenditures \$399,999.47. In 1915, however, \$17,000 was expended for the Bureau of Corporations, which has since been merged into the Federal Trade Commission. Deducting this

amount from the expenditures for that year, and comparing the remainder \$382,999.47 with expenditures for 1916, it will be seen that there was an increase for the Department, as at present constituted, of \$6,806.31 or 1.76 per cent.

The estimated cost of unbilled and uncompleted work of the Department at the Government Printing Office on July 1, 1916, was \$65,718.12, while the actual cost of such work at the Printing Office on July 1, 1915, was \$55,993.72.

During the fiscal year 1916 the Department issued on the Public Printer 3,709 requisitions for printing and binding, which was an increase of 618 over 1915. At the close of business June 30, 1916, there were at the Government Printing Office 379 requisitions on which deliveries of completed work had not been made, compared with 436 on the same date in 1915.

The following table gives the cost of printing and binding for each of the bureaus, offices, and services of the Department during the fiscal years 1915 and 1916, as well as the increase or decrease in 1916 for each bureau, office, and service and the estimated cost of the work on hand but not completed June 30, 1916:

Bureau, office, or service.	Cost of work delivered.		Increase (+) or decrease (-).		Estimated cost of work not completed June 30, 1916.
	1915	1916	Cost.	Per cent.	
Office of the Secretary (Secretary, Assistant Secretary, Solicitor, Chief Clerk, and Division of Publications)	\$19,537.58	\$16,581.71	-8,955.87	-15.13	\$1,411.39
Appointment Division	379.23	236.86	- 142.36	-37.54	.....
Disbursing Office	412.18	747.23	+ 335.05	+81.29	14.92
Division of Supplies	686.04	601.39	- 84.65	-12.34	.....
Bureau of the Census	122,302.82	84,766.94	-37,535.88	-30.69	35,496.35
Coast and Geodetic Survey	26,345.70	28,795.27	+ 2,449.57	+ 9.30	9,957.13
Bureau of Corporations	\$17,000.00	.....	.....	.....	.....
Bureau of Fisheries	15,916.27	12,460.20	- 3,456.07	-21.71	903.35
Bureau of Foreign and Domestic Commerce	103,229.74	131,262.35	+28,032.61	+27.16	8,329.61
Bureau of Lighthouses	24,428.15	21,080.27	- 3,347.88	-13.71	637.00
Lighthouse Service	5,853.89	7,208.17	+ 1,354.28	+23.13	274.12
Bureau of Navigation	14,123.91	16,928.30	+ 2,744.39	+19.35	507.70
Shipping Service	2,272.30	4,478.48	+ 2,206.18	+97.09	138.84
Radio Service	705.67	804.76	+ 99.09	+14.80	71.34
Bureau of Standards	24,876.32	35,792.12	+10,915.80	+43.88	4,134.66
Office of the Supervising Inspector General, Steamboat-Inspection Service	2,201.64	2,335.03	+ 133.39	+6.05	33.09
Steamboat-Inspection Service	2,201.64	2,335.03	+ 133.39	+6.05	33.09
Customs Service	2,201.64	2,335.03	+ 133.39	+6.05	33.09
Total	320,220.47	320,205.78	-14,614.69	- 4.53	65,718.12

* Includes \$4,613.24 expended by the Department and \$12,326.76 transferred to the Federal Trade Commission on Mar. 15, 1915, in accordance with the requirement of the act creating the Commission, approved Sept. 26, 1914.

The amount and cost of each class of work called for by requisitions on the Public Printer during the fiscal years 1915 and 1916 are comparable in the following statement:

Class.	1915	1916	Increase (+) or decrease (—).	
	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Per cent.</i>
Blank forms.....	15,559,663	15,859,014	+ 299,351	+ 1.92
Reports, pamphlets, etc.....	3,370,410	4,447,984	+ 1,077,574	+ 31.97
Letterheads.....	3,427,500	3,192,000	— 235,500	— 6.87
Envelopes.....	153,500	136,675	— 16,825	— 10.96
Circulars, summaries, and notices.....	541,200	2,900,900	+ 2,359,700	+ 436.01
Index cards.....	1,220,700	1,133,500	— 87,200	— 7.14
Guide cards and folders.....	411,650	305,000	— 106,650	— 25.91
Memorandum sheets.....	5,678,000	3,355,500	— 2,322,500	— 40.90
Blank books.....	28,597	19,955	— 8,642	— 30.22
Miscellaneous books (binding).....	3,945	5,898	+ 1,953	+ 49.51
	<i>Cost.</i>	<i>Cost.</i>	<i>Cost.</i>	<i>Per cent.</i>
Blank forms.....	\$51,225.93	\$38,128.35	— \$13,097.58	— 25.57
Reports, pamphlets, etc.....	301,666.94	309,652.01	+ 7,985.07	+ 2.65
Letterheads.....	5,208.85	4,441.32	— 767.53	— 14.74
Envelopes.....	265.96	404.38	+ 138.42	+ 52.05
Circulars, summaries, and notices.....	2,455.25	8,194.77	+ 5,739.52	+ 233.77
Index cards.....	1,104.74	917.97	— 186.77	— 16.90
Guide cards and folders.....	1,910.98	1,264.69	— 646.29	— 33.82
Memorandum sheets.....	3,275.18	2,454.04	— 821.14	— 25.07
Blank books.....	11,296.06	14,686.95	+ 3,390.89	+ 30.02
Miscellaneous books (binding).....	8,481.08	9,179.56	+ 698.48	+ 8.24
Miscellaneous.....	721.74	481.74	— 240.00	— 33.25
Transferred to Federal Trade Commission (Bureau of Corporations) on Mar. 15, 1915.....	12,386.76			
Total.....	399,999.47	389,805.78	— 10,193.69	— 2.55

During the fiscal year 1916 the Department issued 1,945 publications, compared with 1,038 during the fiscal year 1915. Those issued in 1916 contained a total of 61,702 printed pages, compared with 61,301 in 1915, and there were printed of them for the Department a grand total of 7,124,035 copies, against 3,753,795 in the preceding year, an increase of 3,370,240 copies. While nearly all bureaus show increases, the Bureau of the Census and the Bureau of Foreign and Domestic Commerce contributed the larger ones, due in the case of the former to the printing of several hundred summaries of the results of the census of manufactures in 1914 and in the case of the latter mainly to a large edition of a circular advising the public to save their rags and other paper-making materials.

The publication work of each bureau of the Department for the fiscal years 1915 and 1916 is summarized in the following table:

Bureau or office. ^a	Publications.		Pages.		Copies printed for Department.		Cost. ^b	
	1915	1916	1915	1916	1915	1916	1915	1916
Office of the Secretary.....	64	77	2,237	2,428	157,250	261,890	\$6,055.39	\$6,331.07
Bureau of the Census.....	138	836	19,937	14,165	524,625	1,432,910	97,830.49	54,283.37
Coast and Geodetic Survey.....	29	56	3,197	3,960	55,060	79,750	21,630.72	22,218.71
Bureau of Fisheries.....	57	81	3,159	2,620	66,200	171,350	11,908.88	10,339.36
Bureau of Foreign and Domestic Commerce...	494	575	18,708	21,645	2,108,460	4,359,300	98,937.71	120,459.01
Bureau of Lighthouses...	87	129	3,548	4,361	258,300	351,175	25,188.70	21,646.99
Bureau of Navigation.....	17	23	2,523	3,207	55,900	59,950	12,154.79	17,483.47
Bureau of Standards.....	137	150	6,662	8,328	153,400	203,050	19,408.79	28,209.20
Steamboat-Inspection Service.....	15	18	1,330	988	372,600	204,800	8,511.22	8,062.35
Total.....	1,038	1,945	61,301	61,702	3,753,795	7,124,035	302,620.69	289,033.53

^a In 1915 the Bureau of Corporations (which has since been merged in the Federal Trade Commission) issued 10 publications, containing 2,550 pages, of which 24,100 copies, costing \$14,319.65, were printed. These figures, however, are excluded from this table and from computations based on figures therein in order to reach more accurate comparisons in the work of the other bureaus and the Department as a whole.

^b Figures relate to publications actually delivered to the Department during the year; consequently they do not agree with similar figures in a preceding table giving the cost of work done by the Government Printing Office during the fiscal year. Frequently the cost of a publication is charged against allotments for two or more fiscal years.

During the year 3,648,311 publications and printed circulars of the Department were distributed to the public through the Division of Publications, compared with a total of 2,523,994 during the fiscal year 1915, an increase of 1,124,317, or over 44 per cent. Of the total number distributed in 1916, 3,239,685 were wrapped and mailed by the Superintendent of Documents and 408,626 by the Division of Publications. Those wrapped and mailed by the Superintendent of Documents comprised a mailing list distribution of 2,834,575 and a distribution in response to individual requests of 405,110.

The Department during the year received and acted on 104,833 miscellaneous requests, calling for 605,110 copies of publications, compared with 79,738 requests, calling for 385,208 copies in 1915. This was an average of 348 requests and 2,010 publications for each working day, against an average of 265 requests and 1,280 publications during the preceding year.

Roundly, about four-fifths of the Department's publications are sent to firms and individuals on regular mailing lists. In addition, many other classified mailing lists have for use in

sending typewritten or multigraphed information to persons interested in the various activities of the Department. These lists are maintained in the Division of Publications.

On July 1, 1916, there were in the Division 348 mailing lists, containing 267,939 names, compared with 314 lists, with 169,595 names, a year ago. During the year 108,435 names were added to the lists and 10,091 were dropped from them, making a net increase for the year of 34 lists and 98,344 names. More than 18,000 changes of address of persons on existing mailing lists were also made.

Stencils or plates are in use for 335 lists, with 254,317 names, of which the stencils or plates for 209 lists, with 176,419 names, are preserved in the Division and those for 126 lists, with 77,898 names, are kept in the Office of the Superintendent of Documents. For 13 lists, comprising 13,622 names, stencils have not been embossed, the lists being preserved in card form only.

During the past year there was installed in the Division machinery for an entirely new addressing system. This required the cutting or embossing of new address plates for 209 mailing lists, containing 176,419 names. This work was accomplished under difficulties, but without any delay or confusion; and the Department has now in operation one of the most modern, complete, and efficient addressing and mailing equipments in the country.

This Department has for several years cooperated with the Superintendent of Documents in testing public sentiment as regards the selling of Government publications. That the public is willing to pay a nominal price for them has been evidenced—if indeed it has not been fully demonstrated—by the large increase in sales of publications of the Department of Commerce during the past fiscal year. Figures furnished by the Superintendent of Documents show that during the year ended June 30, 1916, 89,747 copies of the Department's publications were distributed by the Superintendent of Documents through the medium of miscellaneous sales, compared with 43,370 in 1915. For the same period 3,280,888 copies were distributed by annual subscriptions, against 1,348,741 copies in 1915, making a total sales distribution for the year of 3,370,635 copies, compared with only 1,392,111 copies in 1915—an increase of 1,978,524 copies, or more than 142 per cent. Receipts from these sales and subscriptions increased from \$22,278.05 in 1915 to \$44,227.93 in 1916, a gain of \$21,949.88, or nearly 100 per cent.

The most significant feature of these figures has to do with the amount saved to the Department in expenditures for printing. It is safe to say that were the Department's publications distributed on a strictly free basis four publications would be given away where now only one is sold. One seldom buys what he does not want, while, on the other hand, modesty is rarely displayed in asking for something which may be had for nothing, even though the free article has no value and is utterly lacking in interest to the recipient. And as a result, instead of more than \$44,000 coming back into the Treasury, probably \$175,000 more printing money would have been required in 1916 for the Department to meet the free demand, and there would still be the costs of wrapping, mailing, transportation, and delivery for additional millions of pamphlets, a large proportion for possible immediate consignment to waste baskets.

The following summary of sales by the Superintendent of Documents during each of the past six years of publications issued by the Department is gratifying evidence of the estimate which the general public places on these publications:

Year.	Miscellaneous sales.		Subscriptions.		Total receipts. ^a
	Copies.	Receipts. ^b	Number.	Receipts.	
1911.....	9,233	\$14,893.00	.....	\$27.10	\$14,920.10
1912.....	30,071	5,708.44	539	2,749.75	8,458.19
1913.....	10,423	4,004.90	573	1,958.55	5,963.45
1914.....	40,648	7,804.85	2,329	5,789.80	13,594.65
1915.....	43,370	9,603.50	3,705	12,674.55	22,278.05
1916.....	^b 89,747	^b 17,719.84	^c 11,326	26,508.09	^b 44,227.93

^a Includes in 1911, \$13,255; in 1912, \$2,450; and in 1913, \$1,090, received from sales of the 1911 World Trade Directory, which, by direction of Congress, was sold at \$5 per copy.

^b Preliminary figures.

^c Total number of copies of publications distributed, 3,280,888, each subscription being for one copy of each issue of a publication for a definite period.

One of several very sure indexes to the increasing activities of the Department is afforded by the product of a duplicating plant installed in the Division of Publications about four years ago. This equipment was designed to aid the bureaus in making duplicate copies of typewritten letters and documents quickly, accurately, and in larger numbers than in ordinary manifold operations. The following statement showing the amount of work turned out by the plant for each of the last four years indicates the extent to which it has been utilized by the bureaus and offices of the Department.

Year.	Requisitions filled.	Pages duplicated.	Copies printed.
1913.....	600	882	677,746
1914.....	1,591	3,150	1,176,366
1915.....	3,169	7,142	3,816,937
1916.....	3,260	8,424	5,813,890

The figures in the table show increases for 1916 over 1915 as follows: Requisitions filled, 91, or nearly 3 per cent; pages duplicated, 1,282, or 18 per cent; copies printed, 1,996,953, or 52 per cent.

Three years ago the Department adopted the practice of giving wide publicity, through newspaper advertisements, to proposed contracts for materials and supplies. Large sums are expended each year for such materials and supplies and the publicity given has resulted in greater competition and more satisfactory contracts than formerly. The following statement shows the cost of this advertising for several years:

Year.	Advertisements inserted.	Authorities to publish issued.	Insertions authorized.	Total cost.
1910.....	49	238	715	\$1,721.36
1911.....	26	86	260	439.40
1912.....	27	112	295	531.38
1913.....	33	153	434	660.46
1914.....	159	526	1,408	1,968.41
1915.....	226	797	2,143	3,058.14
1916.....	223	732	2,037	2,619.71

^a Figures subject to slight revision, owing to a few estimates of cost having been made in cases where newspapers have delayed rendering bills.

Work of the Solicitor's Office.

During the fiscal year ended June 30, 1916, 245 contracts, totaling \$1,316,163, together with 11 contracts of indeterminate amounts; 45 leases, amounting to \$29,452; 33 revocable licenses, amounting to \$1,600; 14 insurance policies in the sum of \$826,400; and 299 bonds, amounting to \$616,050, were examined (approved, disapproved, drafted, redrafted, or modified).

The number of legal opinions rendered, formal and informal (memorandum), numbered 341. In addition to the above, 1,278 miscellaneous matters, embracing everything submitted for the advice or suggestion of the Solicitor, or for the formulation of departmental action, not included in the foregoing items, were handled by this Office.

Motor Vehicles.

The two gasoline trucks, one 1,500-pound capacity and one 2,000-pound capacity, have been operated by the Department for carrying mail and supplies between the Commerce Building, the city post office, and the various bureaus of the Department and making miscellaneous trips to the several executive departments, etc.

The 1,500-pound capacity truck ran 11,076 miles during the year, averaging 39.2 miles each day and making 11.6 miles on each gallon of gasoline used. The total cost of maintaining the truck amounted to \$440.66, or less than 4 cents a mile.

The 2,000-pound capacity truck ran 8,444 miles during the year, averaging 28.3 miles each day and making 11.1 miles on each gallon of gasoline used. The total cost of maintaining the truck amounted to \$348.72, or slightly in excess of 4 cents a mile.

The Department purchased during the year a 1,000-pound capacity gasoline truck for hauling mail, the collection of test samples from various departments, and making miscellaneous trips between the Commerce Building, the Bureau of Standards, etc. Early in January a schedule was established providing for three round trips daily. The truck was put into operation on January 8, 1916. It covered 6,230 miles up to and including June 30, averaging 41 miles each day and making approximately 14.7 miles on each gallon of gasoline used. The total cost of maintaining the truck from January 8, 1916, to June 30, 1916, amounted to \$81.01, or an average of $1\frac{1}{3}$ cents a mile. The low cost per mile of this truck is due to the fact that as it is new little extra equipment was required for it.

The Department also added a package-carrying motorcycle to its equipment during the year. This is used to deliver special packages and letters to the outlying bureaus of the Department, to the several executive departments, and to the Capitol. It has proved invaluable for use between the Commerce Building and the Bureau of Standards, which is far away. The motorcycle was put into operation May 11, 1916, and up to the close of the fiscal year ran 830 miles, averaging 20.2 miles a day and making 34.5 miles on each gallon of gasoline used.

First-Aid Outfits Needed for Department's Buildings.

The necessity of having the Department's buildings equipped with first-aid outfits was brought to my attention during the year

by an employee. Upon investigating the matter I found the Comptroller of the Treasury had decided that in the absence of an express provision of law such outfits could not be purchased for the use of employees whose compensation is fixed by law. As first-aid outfits are furnished by private concerns, there seems no reason why the Government should be less solicitous about the welfare of its employees. I am therefore including an item in the estimates of appropriations for the next fiscal year requesting Congress to authorize the purchase of such outfits.

Stock and Shipping Section.

There were received and filled by the stock and shipping section during the year 8,852 requisitions for supplies of all kinds, of which 3,392 were for the offices and bureaus of the Department located in Washington and 5,460 were for the outside services. Of the total number of requisitions received, 4,199 were for blank forms, 599 were for printed stationery, and 4,054 were for miscellaneous stationery supplies.

To fill the 5,460 requisitions for the outside services required the packing and shipping of 7,772 pieces, weighing 204,886 pounds, or over 102 tons, of which 6,751 pieces, weighing 146,220 pounds, were sent by ordinary mail, 374 pieces, weighing 4,478 pounds, were sent by registered mail, and 647 pieces, weighing 54,188 pounds, were sent by freight or express.

The following table shows the number of books and blanks sent to each of the outside services during the year:

Service.	Blank books.	Blank forms.	Service.	Blank books.	Blank forms.
Customs Service:			Steamboat-Inspection Service.	250, 525	1, 090, 118
General.....	5, 876	774, 148	Lighthouse Service.....	7, 015	1, 084, 078
New York.....	321	94, 500	Miscellaneous.....	534	157, 474
Shipping Service.....	5, 556	188, 530			
Radio Service.....	725	248, 724	Total.....	270, 552	3, 637, 562

The following table gives the quantity of each class of printed stationery supplied during the year:

Envelopes.....	4, 335, 350	Blank books.....	4, 859
Letterheads.....	574, 000	Blank forms.....	243, 942
Memorandum sheets.....	4, 073, 600	Index cards.....	800, 100
Embossed letterheads.....	24, 500	Guide cards.....	104, 610
Embossed envelopes.....	12, 100	Vertical folders.....	87, 650
Stenographers' notebooks.....	3, 882		

In addition to the foregoing there were placed with the contractors 523 orders for 4,347,450 envelopes, costing \$6,093.73, of which 3,286,950 were used by the offices and bureaus of the Department located in Washington and 1,060,500 were used by the outside services.

Exhibits.

The bureaus of this Department engaged in work along safety-first lines, namely, the Bureaus of Standards, Lighthouses, Coast and Geodetic Survey, Navigation, and the Steamboat-Inspection Service, participated in the Safety-First Exposition held at the New National Museum from February 21 to 26, 1916. The following exhibits in particular attracted a great deal of attention: A direction indicator for wireless messages, invented by an employee of the Bureau of Standards; a revolving lens of the Lighthouse Service; a series of sketches illustrating the development of a mariner's chart, shown by the Coast and Geodetic Survey; a complete radio set of the type now in general use on passenger vessels and also a set used in the early days of wireless, exhibited by the Bureau of Navigation; and models of various types of life-saving equipment, exhibited by the Steamboat-Inspection Service.

The Department refunded \$2,500 of the \$55,625 allotted to it by the Government Exhibit Board to make exhibits at the Panama-Pacific International Exposition at San Francisco, Cal. The exposition closed on December 4, 1915, and a portion of the exhibit material was loaned to the National Exposition of Panama, held in the City of Panama from January 21 to May 1, 1916, which material has since been returned to the Department. Other exhibit material was diverted for use at the Panama-California International Exposition at San Diego, as provided by Public Resolution No. 1, approved December 17, 1915.

Authority to Make Purchases not Exceeding \$25 Without Obtaining Proposals.

Section 3709 of the Revised Statutes provides that—

All purchases and contracts for supplies or services, in any of the Departments of the Government, except for personal services, shall be made by advertising a sufficient time previously for proposals respecting the same, when the public exigencies do not require the immediate delivery of the articles, or performance of the service.

In the estimates submitted to Congress for the current fiscal year, this Department requested authority to make purchases not exceeding \$25 without complying with this provision of law, but the request was not given favorable consideration. During the fiscal year ended June 30, 1916, the Chief Clerk's Office issued

244 sets of proposals involving purchases not exceeding \$25 each. The average cost of each purchase amounted only to \$7.33. The number of proposals sent out for each purchase averaged 4. It is conservative to state that the clerical labor of writing, comparing, mailing, listing, receiving, tabulating, and writing awards on these proposals involved an expenditure almost as great as the cost of the articles purchased. No modern business concern would tolerate a system where the purchase cost bears such a relative value to the cost of the goods purchased. The general merit of the provision of section 3709 is admitted, but its requirements serve no useful purpose when applied to the large number of small purchases that are necessary. Congress has recognized the wisdom of removing small purchases from the requirements of this section by provisions similar to the one requested by this Department which were enacted into the laws applying to the Department of Agriculture and the District of Columbia. The matter will therefore be resubmitted to Congress in the estimates for the fiscal year 1918.

Transfer of Commerce Building.

On March 3, 1916, the Commerce Building, rented and occupied by this Department, was purchased from the Commerce Building Co. by Mrs. Henrietta M. Halliday for a consideration of \$800,000.

Consolidated Department Library.

The past year has been one of definite progress in the consolidated library in the Commerce Building. The number of volumes on hand June 30, 1916, was 103,738, against 100,000 last year, or 3,738 accessions. During the year 952 weekly and monthly periodicals were currently received, 918 of which are received in exchange for the Department's publications; 761 books were received from the Library of Congress as copyright transfers; 5,961 books were reclassified, which involved changing labels, making book cards, and changing class numbers on approximately 23,804 catalogue cards; 5,438 volumes, consisting of duplicates and books no longer required, were disposed of, thus making shelf room for new material; and 535 volumes were sent to the Government Printing Office for binding or rebinding. A very important part of the work accomplished in the library during the year has been the cataloguing of all available material on the subject of commerce. This is of particular importance in connection with the work of the Bureau of Foreign and Domestic Commerce.

Typewriter Purchases.

The Department purchased during the year 198 typewriters, 115 for use in the District of Columbia and 83 for the outside services. The total cost was \$14,561.50. The allowance for old machines given in exchange was \$3,469.75, making an outlay for new machines of \$11,091.75, an average price of \$56.02 paid for each machine.

Fire-Alarm Equipment.

A selective ringing fire-alarm system, consisting of 24 boxes and bells, 2 on each floor, was installed in the Commerce Building during the year. The pulling of a lever on any floor rings all the bells in the building and indicates the floor on which the alarm is sounded. Two fire drills were held, one on February 28 and one on May 8, when the building, occupied by 1,200 employees, was emptied in eight and six minutes, respectively.

Foundation for the Promotion of Industrial Peace.

The Nobel Peace Prize was awarded to Hon. Theodore Roosevelt, the twenty-sixth President of the United States, on December 10, 1906. The Foundation for the Promotion of Industrial Peace was created by the act of Congress dated March 2, 1907 (34 Stat., 1241), for the purpose of using the Nobel Peace Prize awarded to Hon. Theodore Roosevelt, as "the nucleus of a fund the income of which shall be expended for bringing together in conference at the city of Washington, especially during the sessions of Congress, representatives of labor and capital for the purpose of discussing industrial problems, with the view of arriving at a better understanding between employers and employees, and thus promoting industrial peace."

The following were appointed trustees of the Foundation: The Chief Justice of the United States; the Secretary of Agriculture; the Secretary of Commerce (and Labor); John Mitchell, then president of the United Mine Workers of America, representing labor; Marvin Hughitt, then president of the Chicago and North-Western Railway Co., representing capital; and Seth Low and Thomas G. Bush, representing the general public.

Both representatives of the public are dead. Mr. Thomas G. Bush died several years ago, and the vacancy has not been filled, while Hon. Seth Low died on September 17, 1916, so that the following gentlemen now constitute the trustees: Hon. Edward D. White, Chief Justice of the United States; Hon. D. F. Houston, Secretary of Agriculture; Hon. William C. Redfield, Secretary of

Commerce; John Mitchell, representing labor; and Marvin Hughitt, representing capital.

The first meeting of the Foundation during my tenure of office as Secretary of Commerce was held on May 28, 1914, those present being Messrs. White, Houston, Redfield, Low, and Mitchell, together with George C. Havenner, Chief Clerk of the Department of Commerce, acting as assistant secretary of the Foundation. At this meeting the difficulties encountered by the Foundation, due to the small income from the fund and the fact that the members of the board of trustees were so widely scattered, were discussed in detail and a committee consisting of Messrs. Low, Mitchell, and Redfield was appointed to consider and report on the whole constitution and future program of the Foundation, with power to direct the treasurer to invest the cash on hand.

This special committee submitted its report at the next meeting of the board of trustees, held in the office of the Secretary of Commerce on January 16, 1915, Messrs. Edward D. White, William C. Redfield, Seth Low, and John Mitchell being present, which report included the following resolution, unanimously adopted:

Resolved, That the Congress be petitioned to permit the return to the Honorable Theodore Roosevelt of the Nobel Peace Prize Fund, as it may stand in securities and cash at the time when the transfer is made, and for authority to dissolve the Foundation for the Promotion of Industrial Peace.

Resolved, That the special committee have authority to attend to all details growing out of the foregoing resolution.

No other meeting of the board of trustees has been held.

The Solicitor of the Department of Commerce prepared bills (S. 7410 and H. R. 21236) to dissolve the Foundation and return the fund to the donor. These were introduced, but no action was taken upon them.

A statement received from the American Security and Trust Co., of this city, treasurer of the Foundation, shows the condition of the fund under date of October 1, 1916, to be as follows:

Securities:

New York City (registered), 4½ per cent corporate stocks, May 1, 1957.	\$30,000.00
New York City (coupon), 6 per cent revenue bonds, Sept. 1, 1917. . .	2,000.00
American Security & Trust Co. 3 per cent certificate of deposit, Dec. 21, 1916.	9,135.00
American Security & Trust Co. 3 per cent certificate of deposit, Mar. 26, 1917.	2,000.00
Total securities.	43,135.00
Cash on hand, capital account.	\$1.95
Cash on hand, income account.	890.49
Total cash on hand.	892.44
Total present worth.	44,027.44

Status of Proposed Legislation Affecting the Department.

On page 199 of my report for the fiscal year ended June 30, 1915, is printed the recommendations of the Board of Inquiry into the *Eastland* disaster. Every one of the recommendations of that board have received definite action at the hands of this Department. The following bills were drafted under my direction and introduced in both the Senate and the House of Representatives:

House bill 4787, providing for the appointment of a board of naval architects to be a part of the Steamboat-Inspection Service of the Department of Commerce and prescribing their duties. This bill covers paragraphs 1, 2, and 5 of the *Eastland* board's report. It has not yet been acted upon by the committees to which it was referred.

House bills 4781, 4783, and 4785, amending sections 4464 and 4465 of the Revised Statutes and relating to appeals from boards of local inspectors. The Committee on the Merchant Marine and Fisheries of the House of Representatives held hearings on these bills and combined them into House bill 13831, which was passed by the House of Representatives on June 5, 1916. It went to the Senate and was referred to the Committee on Commerce, which has not as yet reported it. This bill covers the recommendations in paragraphs 3 and 4 of the *Eastland* board's report.

The Solicitor of the Department has given his personal care to the above measures and has done everything within his power to urge their consideration and passage. The Department earnestly desires that the foregoing measures shall become laws.

The following legislative matters have also been given the attention of the Department:

House bill 449, providing for 11 supervising inspectors, instead of 10. This measure is intended to remedy the impossible conditions existing in the first steamboat-inspection district, illustrated and described herein and on pages 193 and 194 of my last report. The measure passed the House of Representatives February 7, 1916, and is pending in the Senate.

House bill 4782 relates to hydrostatic tests of boilers, and was prepared by the Steamboat-Inspection Service. No action has been taken upon it.

House bill 4784 embodies my recommendation to change the name of the Steamboat-Inspection Service to the Marine Inspection Service. It passed the House of Representatives February 21, 1916, and is pending in the Senate.

House bill 13112 amended section 14 of the seamen's act to correct an apparent misunderstanding in regard to life buoys. This bill has become a law.

House bill 11254, commonly known as the "dogfish bill," providing an appropriation of \$25,000 for developing the fishery of dogfish and for other economic uses in other directions, is now a law.

House bill 14338, authorizing aids to navigation and other works in the Lighthouse Service and the installation of wireless apparatus on the seagoing vessels of said Service, became a law August 28, 1916.

The bill for the protection, regulation, and conservation of the fisheries of Alaska was reported to the House of Representatives by the Committee on the Merchant Marine and Fisheries in the closing days of the session, and the bill and report were referred to the Committee of the Whole House on the state of the Union.

The bill amending section 3 of the organic act creating the legislative assembly in the Territory of Alaska, and which will prevent the Territory from imposing other and additional taxes on the fish industry, was referred to the House Committee on Territories, where it is now pending.

I renew the recommendation in my last report that the Government initiate negotiations to purchase Dutch Harbor, the abandoned village of the North American Commercial Co. in Alaska. The condition described on pages 179 and 180 of my report of last year still prevails, and the suggested purchase can hardly fail to be one profitable to the Government.

The Department has caused to be prepared a series of comparative maps showing certain of the important countries of the world, imposed upon the United States on the same scale. The object has been to awaken an intelligent interest in these countries and to give comparative information concerning them not now known to be readily available. Copies of these maps have been furnished to business houses, to schools of business administration, to chambers of commerce, and to such other parties as were interested in the development of trade in the respective countries.

I emphasize the moral obligation which exists to increase the salaries of the Supervising Inspector General of the Steamboat-Inspection Service and the Commissioner of Navigation to an equal basis with the other chiefs of the Department. Congress has imposed upon each of these Services duties which add greatly to the burdens and responsibilities of its respective chief. It is not

equitable to demand a very much larger volume of labor while providing no compensation for same. The officers in question are underpaid, and simple justice requires that they be adequately compensated for the valuable service they perform. Under the Bureau of Navigation a statement is given of the additional duties imposed by a series of laws on this Service which have at least doubled the amount of work required of it.

In my last year's report, on page 145, I recommended that lighthouse inspectors be compensated more adequately for their valuable service. These officers are now paid less than are others of similar technical standing and responsibility. The following comparison of salaries speaks for itself:

Lighthouse inspectors (except third district), each.....	\$2, 400
Naval officer and Army Engineer officer (part of time) replaced by each lighthouse inspector, average pay and allowance per district.....	5, 000
Assistant engineers, War Department, under Engineer officers and not charged with independent responsibility, average in 16 cities.....	3, 300
Captains in Coast Guard (also retirement pension).....	4, 000
Superintendents, Coast Guard (formerly Life-Saving Service), including longevity pay (also retirement pension).....	3, 000
Supervising inspectors, Steamboat-Inspection Service.....	3, 000
Assistants, Coast and Geodetic Survey, 12 officers receive from.....	\$2, 500 to 4, 000

A provision authorizing the increase of pay for all these inspectors, except the third district (already paid \$3,600), to not exceed \$3,000 was reported favorably by the Committee on Interstate and Foreign Commerce of the House of Representatives and by the Committee on Commerce of the Senate, and the item was included in the Lighthouse bill as passed by the Senate. It is earnestly hoped this may be enacted into law at the next session. The matter is treated more fully in the report of the Commissioner of Lighthouses.

The request of the Department for an increase in the number of commercial attachés from 10 to 20 was declined by Congress. The request will be renewed at the coming session. The time for increasing this invaluable working force is now. To postpone it until after the war is to lose the golden opportunity. Every day in which we fail to develop our foreign trade by an enlarged working force is a day largely wasted and an opportunity lost not to be recovered.

Increased Cost of Living.

The Department is embarrassed in its present operations and in the preparation of its estimates for the coming fiscal year by the increased cost of materials and supplies of many kinds, by the

advances in wages in many directions, and, as regards the adequacy of salaries paid, by the great increase in the cost of living. Economic publications report an advance in a single year of 34 per cent in the cost of the commodities required for the life of a family. This can only mean that many of those who are depending to-day upon the same salaries they received one or two years ago must be cruelly cramped. Such a condition can only react unfavorably on their effectiveness as workers in the public service.

Such a condition also directly affects the cost of living of the Government itself. It can not secure men at the same wages it has paid in the past, nor can it purchase goods at the prices formerly paid. For lack of means to run them, arising in large part from the above causes, two vessels of the Lighthouse Service and a small ship in Alaska of the Coast and Geodetic Survey have long been idle. Meanwhile the public work suffers. We must take our choice in the coming year of paying wages and purchasing supplies on the current basis or else must still further restrict the public work.

Cooperation with Foreign Chambers of Commerce.

In many foreign countries there are so-called American chambers of commerce purporting to serve specially the interchange of trade between the country in which they are located and our own. There is no doubt that some of these organizations do good service. On the other hand, it is possible some of them may not be wholly disinterested in their work. They have no official or even semi-official relation with our Government of any kind. It would be well if a semiofficial relation between these international chambers of commerce and the Department of Commerce could be brought into being. This would settle the question of disinterestedness, would provide a useful adjunct to the work of our foreign service, and provide such a degree of public supervision as the circumstances seem to require.

Advantages of Free Ports.

Much has been printed about the advantage of free ports, and the advantages of them are real. Their establishment would permit a greater employment of American labor and capital in industries located at the said free ports, whereby the cost of duty on materials used in the manufacture of articles exported from the free ports would be reduced, the cost of cartage and railway transportation would be lessened, and goods could be manufactured

for export on the water front in such a way as to save much of the expense now incurred. There would be no question of rebate of duties on goods entering for manufacture into a free port, for no duties would be charged until they emerged from that free port into the commerce of the country. If reexported, there would be no question of duty at all. The concentration of industries in such a free port and the existence of warehouses therein would form an industrial export unit of high efficiency.

Need for an Archives Building.

The construction of an archives building, of which in recent years there has been much said, would solve two serious problems affecting this Department, namely, the provision for the safeguard of the records of the Bureau of the Census and those of the Coast and Geodetic Survey. The same is true, indeed, of the records of all the services of the Department, but has special weight in the case of the two services concerned. It has been said and is possibly generally assumed that the old Census records have no current value. This is far from true. These records contain information that is constantly sought and which, if lost, could not be replaced. In the case of the Coast and Geodetic Survey, records that have cost millions and on which present and future millions depend are stored under conditions, hereinafter described, which would be thought criminally careless if done by any private concern.

On April 24, 1916, in response to a letter from Senator Miles Poindexter, I wrote the Senator the following, which is printed here to emphasize the importance of the matter as it affects this Department:

It needs but a step from the Capitol into the basement of the building (I had almost said the alleged building) occupied by the Coast and Geodetic Survey to see conditions that are shocking. Land titles all along our seaboard are dependent upon the accurate and continued knowledge of changes in the ocean and river lines. These changes are incessant. Because of them the records are constantly consulted. They go back to colonial days and affect many millions in value. These records, covering our whole Atlantic front, affecting the accuracy of every water-front title from Canada south, are in rolls on wooden racks in the old building occupied by the Coast and Geodetic Survey. It would be impossible to replace these records, and they are, to be very frank, liable to destruction at any hour. The same is true of the costly engraved plates. Many of these, costing great sums, through a century past, are stacked in wooden racks in the basement of the same old structure only to be reached by involved passages which would make saving them impossible should fire occur and under such conditions that a small fire occurring near them and lasting but a short time would destroy property of priceless value which could not be restored. The same is true of the invaluable scientific working library of the Coast Survey. Two fires have already occurred in the building at Greenhof. Had these fires

not been accidentally discovered before they had gone far, the building and the records in it would have been destroyed.

There are many scores of thousands invaluable records of the Bureau of the Census stored in the old Light Infantry Armory Building, at Fifteenth and E Streets NW., where they are exposed to destruction by fire. These records are many of them of importance as affecting the validity of pensions and are constantly consulted for genealogical purposes and others.

There are scientific records in the Bureau of Fisheries exposed to loss from fire in the old building occupied by that Bureau. I think a visit to the upper floor of that building would satisfy you that no sane industrial manager would allow it to stay for a day longer than time sufficient to replace it.

There are in the Bureau of Navigation records of our shipping going back to our earliest days. They are stacked in the basement, and were any serious fire to affect the Commerce Building they would be destroyed along with many others.

It is hardly necessary to go through all the services of the Department. The facts are alike in them all with varying degrees of importance. The Bureau of Standards, located at a distance with substantial buildings, is an exception. If an archives building were constructed, this Department could use to great advantage 85,000 cubic feet of space therein. It should be borne in mind also that the question of effective use of the records is involved as well as that of their safety. Much damage has been done by overhauling records in order to find the one desired in the necessary confusion and a good deal of time has been wasted that would have been saved could the records have been properly stored, located, and catalogued. I venture to think there is no argument for the existence of the Library of Congress that does not apply with great force to the establishment of our Government archives in a building which shall serve for those important records the same purpose that the Library of Congress does for our printed literature.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

Unusual demands have been made upon the Bureau of Foreign and Domestic Commerce during the fiscal year, and it has responded with exceptional service. The year has witnessed an unprecedented development of American export trade. The minds of our business men have turned with increasing determination to the rich promise of foreign markets. Expanding opportunity abroad has created a more vigorous attitude at home. With these things has come a clearer recognition of the facilities afforded by this Bureau as a promotive agency in the furtherance of trade.

Functions of the Bureau.

The primary function of the Bureau is the gathering and giving out of practical data to enable American manufacturers to cultivate the markets of the world with the greatest possible effect. It is constantly watchful at many points in the current of commercial life. From the bazaars of Madras it transmits textile information to the mills of New England. From Bolivia it sends samples of hardware to be inspected by the exporting houses of New York. On the farms of South Africa and Australia its agents investigate the prevailing types of agricultural machinery that they may bring that knowledge to the manufacturing enterprises in our Middle West. The representatives of the Bureau penetrate to the remote regions of the earth that the exporters of the United States may proceed intelligently, on a basis of definite facts, to the conquest of new fields.

It aims at the achievement of visible results. To present practical information to those who can use it, to dispel misapprehensions, to adjust differences, to bring together buyer and seller in an effective manner—these are the ideals toward which the efforts of the Bureau are directed in every aspect of its work. That it has succeeded may be indicated most readily, I think, by an account of some of the things accomplished in the fiscal year just past.

Typical Results Accomplished.

Late in 1915 the Bureau undertook to assist in establishing the smelting of tin in the United States. In January, 1916, an article was published in Commerce Reports stating that arrangements

had been completed by the American Smelting & Refining Co. to bring Bolivian tin ore in quantities to the United States for smelting and refining. As the result of representations made by the State Department at the request of the Bureau, the Bolivian Government assured the United States against discrimination in the matter of export duties on tin or other metal. Under date of July 25, 1916, the American Smelting & Refining Co. advised the Bureau that it was getting out about 15 tons of refined tin a day. It was claimed that the quality of the tin is superior to that which had formerly been imported.

Through the efforts of Bureau officials the Chinese Government decided to equip two cotton mills with American machinery. It placed orders with American manufacturers and builders for machinery and apparatus valued at more than \$700,000.

Through the publication of Foreign Trade Opportunities and the circulation of plans and specifications throughout the United States, American manufacturers have secured orders for supplying railway materials in China aggregating about \$1,200,000. A prominent exporting house in New York was awarded a contract for supplying railway bridges valued at more than \$475,000. A locomotive works secured an order for supplying locomotives valued at over \$289,000. An award was made for the supply of freight cars, valued at \$473,000, to another manufacturer. The above are only the more important items in connection with the orders placed by the Canton-Hankow Railway. Most of these orders are now being executed.

These are a few of the things that the Bureau of Foreign and Domestic Commerce has helped to accomplish. It receives many letters testifying to the value of its work and expressing appreciation of the practical service that it renders to American manufacturers and exporters. These communications are nearly all from firms that have themselves received specific assistance from the Bureau. The New York representative of a firm in Lisbon, Portugal, has this to say:

I take much pleasure in informing you that I have concluded very important business transactions, thanks to the valuable information and precious help I received from your Bureau. Your Bureau furnished me with a few addresses of manufacturers, and, thanks to your assistance, I have been able to place an order for \$95,000.

One of the largest American companies manufacturing low-priced automobiles says:

We wish to take this opportunity to inform you that the results we have obtained through the cooperation of the Bureau of Foreign and Domestic Commerce have been very marked, and we find the Bureau a very efficient help in obtaining foreign trade.

From another great vehicle corporation this statement comes:

We have noticed a great improvement recently in the material contained in the daily Commerce Reports, in the special agents reports, and work of the members of the Consular Service. The present practical value of this we are glad to acknowledge and want to assure you of our hearty cooperation.

A Chicago publication devoted to the milling interests writes as follows:

Your regular Commerce Reports are very valuable to us and can not be duplicated from any source that we know of. The writer wishes to compliment your Bureau on the splendid way in which you get up this information.

The opinion of the Bureau's service entertained by the president of one of the world's most important hardware concerns is shown in the following extract from a letter signed by him:

I wish to take this opportunity to express to you, as I have to others in your Department, my appreciation of the service that it is rendering and the extent to which it is constantly developing and improving in that respect in the interest of the merchants and manufacturers of the United States.

That the Bureau furnishes precise and usable information in the great majority of cases is indicated by a statement made by a manufacturer of Toledo, Ohio:

The service rendered by the Bureau of Foreign and Domestic Commerce to the American manufacturer can not be overestimated. I have used that service in the interests of my company to great advantage in the saving of time and money. I have not yet submitted a question on foreign-trade conditions to the Department that was not fully and satisfactorily answered.

The export manager of a motorcycle company in Michigan expresses the opinion that Commerce Reports are worth \$25 a year to a manufacturer interested in export trade. The actual subscription price is \$2.50.

A Buenos Aires merchant says:

Through your Bureau of Foreign and Domestic Commerce I have been able to get into direct communication with some of the largest manufacturers of the lines in which I am interested, and am pleased to say that I have made several contracts on very agreeable terms.

A firm of St. Louis shoe manufacturers writes as follows:

We find the data very interesting and particularly valuable in our investigations. We more than appreciate your efforts in our behalf and the comprehensive manner in which you have placed this information before us. Each day we learn more of the benefits that accrue in the expansion of our export business through the efficiency of the local bureau.

Commercial Attachés.

During its second year the problems of the commercial-attaché service were not unlike those of last year, when the attachés established themselves at their posts in closer touch with the trade

conditions and methods in the countries to which they were accredited, and increased their points of personal contact. This process continued. There was no scarcity of things to do; the difficulty was rather to eliminate the smaller details of purely local matters in order to devote entire time to the larger trade matters of a national scope.

There were five changes in the fiscal year—one transfer and four new appointments. Mr. Harrington resigned his post at Lima to enter private business; Prof. Hutchinson left Rio de Janeiro to resume his duties at the University of California; Mr. Baker, at Petrograd, returned to the Consular Service; Mr. Baldwin, former Chief of the Bureau, resigned the London post to enter private business; Mr. Downs, at Melbourne, was transferred to Rio de Janeiro, his long experience in trade with Brazil peculiarly fitting him for that post. The new appointments were as follows: Philip B. Kennedy, director of the day division of the School of Commerce and Finance of New York University and a member of the foreign trade committee of the Merchants' Association of New York City, to the Melbourne post; William F. Montavon, of the Insular Service, to the post at Lima; Pierce C. Williams, a department head in one of the leading American export houses, to the London post; and William C. Huntington, agent in charge of the Chicago district office of the Bureau, to the post at Petrograd.

A distinct achievement to the credit of the commercial attaché service has been the part it has played in the fostering of American organizations abroad. It is essential that our commercial interests in foreign fields should be mutually helpful. For this purpose, some form of substantial organizations—outposts of American commerce—which will command the respect of foreign governments and private enterprise is required. It is pleasing to report that our representatives have been able to give substantial assistance in the establishing of such commercial organizations—the American chambers of commerce and commercial clubs abroad. Concrete results have been attained in Rio de Janeiro, in Buenos Aires, in Peking, and in Barcelona. At the suggestion of Commercial Attaché Havens, the American Society in Santiago, Chile, is establishing a commercial section, while in London the movement is under way. Incidentally, the American Chamber of Commerce of China, the American Chamber of Commerce in Rio de Janeiro, and the American Commercial Club in Buenos Aires are sufficiently organized to affiliate with the Chamber of Commerce of the United States of America.

Another important phase of the work of the year was in relation to the investment of American capital abroad. The Department has for some time emphasized the important relation between investments and trade and the commercial attachés have done valuable work on this subject. All the attachés made reports on foreign investments. From South America, the Far East, and Australia, and even from Europe, investment opportunities were reported. Some of these have already been acted upon by American banks and corporations; others are now under consideration. Further to carry on this work, the Bureau has appointed a financial expert as special agent to investigate and report in detail on investment opportunities in South America, and arrangements are being made to appoint another for a similar mission in the Far East.

A new method of investigation was inaugurated this year. Under the direction of the 10 attachés, experts in foreign countries prepared extensive reports, uniform in treatment and practical in character, on the hardware trade in their respective countries. These reports cover all phases of the trade, such as credits, packing, styles, methods of distribution, and sources of supplies, the attachés guiding the work and themselves contributing material of a general nature.

To supplement the reports and to make them more valuable to American manufacturers and exporters, each attaché was given an allotment for the purchase of samples. The samples secured represent the styles and types in common demand and are indicative of either the progress of local manufacturers or of the competition to be met from European markets. They have been assembled in the New York district office and exhibited, together with information as to prices, import duties, country of origin and market, and other data of a very practical nature, to hundreds of interested manufacturers and exporters from all parts of the country. Arrangements are now well under way to make them available in the production centers. When the reports are published, the hardware industry of the United States will be in possession of the most complete information ever furnished by this Government in its trade-promotion work. The Department plans to continue this practical method of investigation by a similar study covering the wearing-apparel trade in South America during the next fiscal year.

In summarizing the activities of the European representatives, the main feature is that their work has been largely deter-

mined and shaped by the war. Mr. Baldwin and, later, Mr. Williams, at London, have kept the Department and, through the Department, American business men informed as to war legislation affecting our foreign commerce. The same is true of the Paris post. Commercial Attaché Veditz, however, found in Spain a more favorable field for trade promotion and continued to devote as much of his time as possible to that country. It was quite often necessary for the attaché to visit Switzerland, to which country he is also accredited, as Switzerland had its contraband and embargo difficulties for American trade. Mr. Thompson's headquarters are theoretically at Berlin. He has made frequent trips there, and it is quite likely that during the coming year he will be there a large portion of his time. Practically, his entire time at The Hague was devoted to the difficulties arising from contraband and embargo and with the Netherlands Oversea Trust. A somewhat similar task at Petrograd confronted Commercial Attachés Baker and Huntington. Moreover, the services of the attaché at this post have been in especial demand by American business men, as interest has increased notably in the trade with Russia. This interest is evidenced by the formation of a strong American-Russian chamber of commerce and by the organization of big trading companies for trade with Russia. The incumbents of the Melbourne post, Mr. Downs and Prof. Kennedy, have likewise been in a country where business is under the domination of war conditions. As far as there has developed a "war normal" in all of these countries, the attachés have been able to devote a larger portion of their energies to general trade investigations. In the war countries especially the commercial attachés have worked closely and cordially with the State Department representatives.

As in the case of Russia, the awakened interest in China as a potential market for American products was an outstanding feature of our foreign trade in the last year. The commercial attaché, Mr. Arnold, had a strenuous year and furnished a wealth of commercial information about his interesting field. Due to the unsettled political conditions, the time was not ripe for great trade expansion, but was suited rather for a survey of the field and the laying of plans for future development. It is pleasing to note that, while not neglecting the important countries to the south of us, our business men have given more attention to the fertile markets of China and Russia.

In South America there was more opportunity for direct trade promotion. All of the Department's representatives have taken

a prominent part in connection with the "return visits" committees which have gone to South America during the year. The attaché at Buenos Aires was of material assistance to the International High Commission. In addition to the promotion of American commercial organizations and valuable reports on investment opportunities by these representatives, special mention should be made of the very careful and thorough study of Brazilian trade by Commercial Attaché Hutchinson, stationed at Rio de Janeiro. In connection with this work, the attaché traveled extensively through all parts of the country with his secretary, and the handbook which is in the course of preparation will be a notable addition to the Department's publications.

As urged in my report for the preceding fiscal year, there is need of an increased appropriation to permit of the appointment of 10 more commercial attachés to be stationed in important districts which deserve attention. Aside from this, I may mention three deficiencies in the service: (1) The legislative limitation that forbids the employment by any attaché of more than one clerk; (2) the lack of funds available for travel; and (3) the lack of any specific appropriation for the maintenance of a staff in Washington to direct the movements and activities of the attachés and adequately handle the increasing amount of correspondence and reports. Because of the value of this service in national efforts for commercial extension abroad, as demonstrated during the past two years, it is earnestly desired that adequate provision be made for the removal of these handicaps and the logical expansion of the work.

Commercial Agents.

The value of the work accomplished by the Bureau's special field service has, it is felt, been very materially enhanced during the fiscal year 1916. A greater variety of subjects has been investigated, and the several phases of the work have been so harmoniously coordinated that an increased efficiency has been clearly observable at all points. A systematic and successful effort has been made to secure men of special competence for this branch of the Bureau's activities. There have been energetic surveys of foreign markets, careful planning and effective supervision on the part of the Washington office, and a consistent purpose to make the resulting data available to American business men in the most practical form. That the Bureau's aim in this respect has been, in large measure, attained is shown by the keen interest and the

spirit of hearty cooperation manifested by important commercial houses and trade associations.

During the fiscal year the Bureau has had a total of 19 agents employed in foreign countries and in the United States. Of these, 3 carried on their work entirely in this country, 3 were concluding work the principal part of which had been done during the previous year, 3 were starting on extended investigations as the year closed, and the others performed the greater part of their special work during the fiscal year. A wide range of subjects was covered, including such diverse topics as banking, cotton goods, lumber, commercial laws, ports and port facilities, and the establishment of a dyestuffs industry in the United States. The territory in which the agents traveled embraced Latin America, the Far East and India, Australasia, and South Africa. The work of 12 of the agents was connected with Latin American markets; 3 with those of China and Japan; 1 with the Straits Settlements, Dutch East Indies, and India; 1 with Australasia; and 1 with South Africa.

Of the Bureau's inquiries, through its commercial agents, into the markets for specific lines, that concerned with the trade in cotton goods has been most extensive. This work was continued last year by Ralph M. Odell, who has been in the employ of the Bureau since 1911. At the beginning of the fiscal year he was concluding a thorough and comprehensive investigation into the cotton-goods trade of China, in which market American sales have become almost negligible in recent years. After finishing in the great oriental Republic, he went on to Singapore, the Dutch East Indies, Ceylon, and India, rendering reports on each of the first three regions and on Madras, in India. At the close of the year he was in Calcutta, where the imports of cotton goods amount to \$100,000,000 annually. He purposed to spend some time there, later visit other parts of India, and then return to the United States.

The other two agents working in the Far East were Mr. Sams, on wearing apparel, and Franklin H. Smith, on lumber. The latter had practically completed his work in China, Japan, and the Philippines when the fiscal year began, and his chief work last year was in Australasia. The report of Mr. Sams on wearing apparel in Japan was received in June and has not yet been published. He will follow much the same route as Mr. Smith, going from the Far East to Australia and New Zealand.

In the investigation into agricultural-implement markets, Juan Homs was assigned to the South African field, with Australia and New Zealand following on his itinerary, while Frank H. von Motz undertook a survey of the South American countries. These regions are among the most promising in all the world with respect to agricultural development in the near future, and the sale of farm implements is sure to grow steadily year after year as new land is opened up or the old more fully cultivated.

In addition to agricultural implements, the special lines that commanded the Bureau's attention in South America last year were fruits and nuts, machinery and machine tools, hardware, and furniture. The data on the trade in fresh fruits were gathered at the instance of western fruit growers, but the reports covered, of course, accounts of the openings for the products of every section of the United States. A small reciprocal trade in fresh fruits has already been established between North and South America, and our apples are fairly well known in the larger cities of the southern continent. In machinery and machine tools the present demand, considering the large area and population of South America, is small, partly because of the very high cost of fuel (particularly in the last year) and partly because of the fact that South Americans have not turned hitherto to mechanical pursuits. J. A. Massel, covering this subject, has visited and reported on Argentina, Chile, Peru, Bolivia, Colombia, and Venezuela, but only the last four were included in the work of the fiscal year.

An investigation that is likely to produce immediate and far-reaching results is that into the lumber markets of South America by Roger E. Simmons. It is confidently believed that very substantial benefits to the lumber-export interests of the United States will accrue from his work. Mr. Simmons, after concluding his reports, traveled for some weeks in this country, interviewing lumber manufacturers and officials of lumber associations.

As regards the work of five other agents in the South American field, it may be said that S. S. Brill, on hardware, and L. L. Bucklew, on furniture, were concluding in the first part of the fiscal year 1916 work that had been chiefly conducted in the preceding fiscal year. W. A. Tucker, on textiles, H. G. Brock, on boots and shoes, and Philip S. Smith, on electrical goods, began work on their respective lines in May, starting first in Cuba as a preliminary to their South American travels.

One of the noteworthy publications issued during the year was "Banking Opportunities in South America," by W. H. Lough,

the result of a six months' tour in the first part of 1915. An inquiry into the commercial laws of South American countries was carried on by E. M. Borchard, who spent six months in South America on a joint mission for this Bureau and the Library of Congress.

The work of one special agent, Garrard Harris, is devoted largely to the collection of material for commercial handbooks. His reports on Central American countries were published in a volume entitled "Central America as an Export Field," and his work since leaving the United States last fall has consisted in part in gathering data for a similar book on the West Indies. It is also planned to have him cover Colombia and Venezuela in the same way, and the whole of the Caribbean district except Mexico will then have been fully described from a commercial point of view.

With respect to the work of agents in the United States, it may be noted first that the Bureau last year sent a special representative, Stanley H. Rose, on what might be called a tour of consultation through the chief sections of the country interested in exporting. His particular mission was to interview business men and advise with them concerning their special problems in export trade, and to acquaint the business public in general with the facilities of the Bureau.

The other two agents in the United States, Dr. Thomas H. Norton and Grosvenor M. Jones, have been engaged on work that has an exceptional value and significance at this time. The activities of the former have been directed to three ends—the establishment of a dyestuffs' industry in this country, the manufacture of nitrogen from the air through hydroelectric power, and the securing of a supply of potash to take the place of that usually purchased from Germany. His efforts along these lines have been uniformly vigorous and judicious, and they have been attended with a very marked success.

An elaborate volume on "Ports of the United States" represents the results of a study of port facilities carried on last year by Grosvenor M. Jones. He subsequently took up the study of ocean transportation, resulting in the publication of two very timely reports—one on "Navigation Laws: A Comparative Study of the Principal Features of the Laws of the Leading Maritime Countries" and the other on "Government Aid to Merchant Shipping."

Because of increased appropriations the Bureau has been able to plan for a notable broadening of the commercial-agent service during the fiscal year 1917. Among the lines to be studied are investment opportunities, paper and printing supplies, railway

supplies, coal, transportation and port facilities, and construction materials, all in South America, and railway supplies, boots and shoes, electrical goods, and possibly motor vehicles and investment opportunities in the Far East and Australasia. With these and the investigations continuing from the past fiscal year the Bureau expects to have between 20 and 25 agents in foreign lands during the fiscal year 1917, and the number may run to 30.

To systematize and facilitate this work, it has been deemed advisable to establish a separate division of commercial agents, which will devote its entire time to the direction of the traveling-agent service. This division was just being formed at the close of the fiscal year. For the present it will consist of four men—a chief, an assistant, an editor, and a clerk and stenographer. It will have its headquarters in New York, where the principal exporting houses can be frequently consulted with regard to the details of export work. Besides working in close cooperation with the agents from the time they are appointed until they leave the service, the new division will undertake to push actively in this country the projects initiated by the men in the field and endeavor to make their work continually productive of tangible results.

District Offices of the Bureau.

As explained in my last annual report, the United States has been divided into eight districts, with district offices in New York, Boston, Chicago, St. Louis, Atlanta, New Orleans, San Francisco, and Seattle. This enables the Bureau to maintain more intimate relations with business men throughout the country.

The district office is first of all a service station, supplied with stocks of the various circulars, trade lists, publications, etc., issued by the Bureau for distribution and equipped with a reference library of publications on foreign trade, commercial directories, and periodicals for the convenience of the business public; second, it is the headquarters of the commercial agent in charge of that district. The latter is expected to keep in touch with the manufacturing and exporting interests in his territory, and to see that they are fully informed as to the services rendered by the Bureau. He endeavors to see that the specific opportunities for the sale of American goods abroad that are received by the Bureau are brought to the attention of the appropriate firms.

There has been a continuous, and in some cases remarkable, increase in the number of visitors at the district offices and the

volume of mail handled. The New York office during the past year received from 5,000 to 7,000 letters a month, while the number of callers at that office rose from approximately 1,000 in June, 1915, to 2,894 in June, 1916.

The district offices serve as headquarters for foreign buyers visiting the United States and render a very important service in putting these men in touch with American manufacturers able to supply their needs. The Bureau's records show millions of dollars' worth of American goods purchased by these visitors with the assistance of its district and cooperative offices. Only a short time ago a South American business man wrote that, through connections he effected as the result of assistance given him by the New York office during his recent visit to the United States, he has sold more than \$250,000 worth of American goods in five months.

To strengthen the personal bonds between the members of the field force and to supplement the exchange of ideas by mail, a special conference was called in Washington at the end of June. This brought together the managers of the eight district offices, the men in charge of five of the cooperative offices, and representatives of four large commercial organizations located in cities where the Bureau has district offices. These men spent five days discussing branch-office problems, consulting with the division chiefs in the home office, with the officers of other Government services, and with those of semipublic bodies that have to do with foreign trade.

A feature of trade promotion that has been given care during the past year is the adjustment of disputes between American exporters and foreign buyers. The Bureau gives special attention to every complaint coming from abroad and endeavors to follow it up to a satisfactory conclusion. There has been a large proportion of acceptable adjustments. The district offices have been able also to render valuable assistance to American houses having difficulties with foreign collections or excessive claims.

On March 1, 1916, the Bureau's exhibit of foreign-manufactured goods at the customhouse in New York was opened to the business public, with an extensive exhibit of hardware and allied lines, collected through the commercial attachés. This exhibit was started and will be maintained for the purpose of showing to our manufacturers possibilities for competing with foreign manufacturers in foreign markets. Accompanying each sample are tags showing the countries of sale and of origin, prices, import duties, and

the volume of sales. There are, in addition, a great many catalogues of the foreign manufacturers. American manufacturers and exporters of hardware were quick to perceive the value of our work and many of them had their representatives make a careful study of this survey of the world's markets. Up to the close of the fiscal year these samples had been exhibited only in New York, but plans are now well under way to display them in all the important trade centers of the country.

It has been clearly demonstrated that the best results are obtained only when a full set of samples along some particular line is exhibited. Instructions have been issued to appropriate field agents to obtain a complete line of samples of wearing apparel in South America. Many samples are received from time to time from consuls and commercial agents. These are exhibited at the various branch offices and by cooperating commercial organizations. It is realized, however, that such individual samples are distinctly less useful than are those obtained by concerted effort and illustrative of an entire industry.

During the fiscal year 1915 a plan was formulated for the establishment of "cooperative offices" of the Bureau, to supplement the work of its district offices. Under this arrangement the Bureau extends to any commercial organization that is willing to maintain a special foreign-trade department in accordance with the Bureau's rules, and to the foreign-trade branches of large railway systems that comply with those rules, exactly the same information and service that it furnishes to its own district offices. Seven of these offices are now in existence, being maintained by the Philadelphia Chamber of Commerce, the Cleveland Chamber of Commerce, the Cincinnati Chamber of Commerce, the Los Angeles Chamber of Commerce, the Portland (Oreg.) Chamber of Commerce, the Cincinnati, New Orleans & Texas Pacific Railway Co. at Cincinnati, and the Southern Railway and allied lines at Chattanooga. Arrangements have practically been completed for the opening of a cooperative office by the Chamber of Commerce in Dayton, Ohio.

The expansion of the system of cooperative offices has gone on slowly, as the Bureau prefers to maintain a very high standard of requirements and develop new offices only where the local organizations have sufficient interest in foreign-trade advancement to give the new office proper support. When competently managed, these cooperative offices have proved of decided usefulness to the commercial organizations establishing them, and it is hoped that

more of the large cities may avail themselves of these aids in the winning of foreign markets.

This system is of great actual and potential importance, since the Bureau's service is thus made readily available to sections of the country that would otherwise not be able to utilize it in such a quick, satisfactory way. The cooperative offices represent a signal step in advance—another movement in the fulfillment of the Bureau's purpose to bring its facilities into intimate relationship with all the business men of the United States. They effect a saving of time, introduce the element of personal contact, arouse a lively local interest, and give rise, in the mind of the commercial community, to a deeper understanding of the governmental efforts that are being made in its behalf.

Cost of Production.

In view of the proposal to create a permanent tariff commission and to transfer to that body the cost of production division, the work of the past year has been directed chiefly to the completion of the investigations already undertaken. Five reports were published dealing with various branches of the clothing industry, women's muslin underwear, hosiery, knit underwear, men's factory-made clothing, and shirts and collars, and one report dealing with the cost of production of cotton-spinning machinery. For all these reports the field work was completed during the fiscal year 1915.

The criticism of industrial conditions contained in the reports was constructive throughout. The best methods of operation were described in full and possible improvements were pointed out. Opportunity for the development of export trade in several lines undoubtedly exists. The most promising markets were indicated statistically and the appropriate means of entering the markets were shown by extracts from consular reports and references to publications of the Bureau. The need of more accurate accounting methods was emphasized and an inexpensive plan of determining cost was given.

Field work during the fiscal year 1916 was devoted chiefly to cane sugar and glass. A force of special agents visited nearly all the cane plantations and sugar mills in Hawaii and later made a similar study in Cuba. The investigation of the glass industry was begun in January, 1916, the branches studied covering plate glass, window glass, wire glass, opalescent glass, lamp chimneys, lighting goods, bottles, fruit jars, and tableware.

Several special studies and reports were prepared, and the division has answered many inquiries, complaints, and other communications concerning the effect of the tariff upon certain industries, high prices, and related subjects. The amount of original work that has been accomplished by the division with its comparatively limited force is a matter of congratulation.

Foreign-Tariff Work.

Considerable attention has been devoted during the year to contemplated changes in commercial and tariff policies due directly or indirectly to the war. Reports were published dealing with the proposals of the British Board of Trade, the Association of British Chambers of Commerce, the Interstate Commission of Australia, and the proposed customs union between Germany and Austria-Hungary. While it is quite probable that some of the same measures embodied in those proposals will not be adopted, it is safe to assume that the war will bring about some radical changes in the tariff policies of the principal industrial and commercial nations of Europe, and such changes may prove of more academic interest to the American manufacturer and exporter. Proposed changes must be closely followed and brought promptly to the notice of the business public.

The trade-mark work of the Bureau is meeting with gratifying success and promises to become of most practical value to American exporters. In addition to giving trade-mark information upon request the Bureau has called the attention of some American exporters to the infringement of their marks in certain Latin-American

1 Statistics.

For the first time substantially complete returns of exports are now received. Heretofore, under laws and regulations prescribing the conditions prevailing a century ago, there was no requirement that the declarations made by exporters. It was a matter of course that many shipments left the country without declaration of quantity or value and that for many others the declaration was purely perfunctory, often made by a forwarder without adequate knowledge of the goods exported. New regulations, issued jointly by the Secretary of the Treasury and the Secretary of Commerce were put in force February 1, 1916, outlining a procedure that insures the presentation of a declaration for every export shipment from the shipper or his duly authorized agent. Before the new regulations were severely

criticized by shippers as an undue interference with commerce; but since their enforcement few complaints, and those easily adjusted, have been received. Accurate export statistics, so essential to correct planning in foreign trade, have thus been obtained with no real burden on our exporters.

Editorial Work.

The editorial work was heavier during the last fiscal year than at any time in the history of the Bureau. Fewer general-trade studies were undertaken through the consular service, but there was a very marked increase in the cost of production reports and in the trade reports submitted by the enlarged field staff of the Bureau. The wide scope of the Bureau's activities makes editorial work difficult. There are hundreds of different reports on hundreds of different subjects. The steady improvement in the character and training of the Bureau's field representatives has made it possible to give more attention to form and less to content, because the trained specialist who submits a report can be depended upon to have his facts correct, and the editorial problem becomes one of presenting these facts in a clear and concise style.

New Officers and Adequate Salaries Needed in Washington.

The Bureau is in urgent need of two additional chiefs of division for service in Washington—(1) a chief of the division of commercial attachés and (2) a chief of the division of branch offices. These two important branches of the service are now in charge of (1) a translator and (2) an editorial clerk, both of whom have other duties that at present demand some of their time and attention. The appropriation for the commercial attachés is so worded as not to permit the employment of any persons in Washington. It therefore has been impossible for the Bureau to employ even an extra clerk to do routine work in connection with the service, and clerks who have other duties have been called away from them in order to attend to it. The same is true of the branch-office service. It is essential that the Bureau have these two places and that men of ability and initiative give their entire time to them. It is certain that the work of the two divisions could be considerably increased if adequate supervision were employed in Washington.

I especially urge that the salaries in this Bureau be brought up to the level of salaries which have been established in other Government departments where men of similar training and ability are required. The Bureau of Foreign and Domestic Commerce comes

into active competition, in selecting men and in retaining its present staff, with other bureaus and commissions, such as the Federal Trade Commission, Interstate Commerce Commission, Tariff Commission, Shipping Board, and other Government departments, to say nothing of the many business opportunities for which our men are particularly well qualified on account of the splendid preparation they receive in our service. The highest salaries paid in any administrative position in the Bureau outside of the Chief of the Bureau are those of the assistant chiefs, one of whom receives \$3,500 and the other \$3,000. Of the chiefs of division one receives \$2,500 and the other but \$2,000. Important divisions, for which no chiefs are provided for by law, are under the direction of officers, variously styled assistant chief of division, commercial agent, expert, expert clerk, editorial clerk, and translator, who receive salaries ranging from \$2,000 to \$2,500.

In the other departments and especially in the commissions referred to above administrative officers doing the same type of work are paid salaries ranging up to \$5,000. It will be absolutely impossible for us to hold some of the best men in our service unless we are enabled to compete with these commissions and other departments. Only recently the Bureau found it impossible to obtain the services of two men simply because another branch of the Government outbid it. I expect in my estimates for this Department to ask Congress for authority to establish a higher scale of salaries, and it is my hope that I shall not only be able to increase the salaries of those who deserve increases, but also to bring in new men who could not be attracted at salaries which we now pay.

The Bureau of Foreign and Domestic Commerce has used its resources to the full in obtaining the information most needed by American business men and in bringing this information to them so as to accomplish the greatest results. But it has not been content with this. The Chief of the Bureau has deemed it his duty to cooperate with other Government offices and with business organizations in every question that affected commerce. Through the cooperation of the Bureau of Foreign and Domestic Commerce the National Association of Credit Men has established a foreign-credit division or information service. The Ways and Means Committee called upon the Bureau frequently for information. In connection with the revision of the duties on dyestuffs the resources of the Bureau were placed fully at the command of the committee. Many other questions relating to cost of production and other fac-

tors connected with the tariff were answered by the Bureau. At the request of the Committee on the Merchant Marine and Fisheries an investigation was made dealing with ocean freight rates.

During the past year this Department through the Chief of the Bureau of Foreign and Domestic Commerce has been cooperating continuously with the Federal Trade Commission and the Forest Service for the betterment of the lumber industry of this country. For some time past the lumber industry of the United States has been in an unstable and depressed condition. This has been due to overproduction and unregulated competition. The lumbermen have appealed to the Government for assistance and have asked that something be done, either administratively or by legislation, to improve the condition of the industry. The Chief of the Bureau of Foreign and Domestic Commerce was, therefore, authorized to confer and cooperate with representatives of the Federal Trade Commission and Forest Service to this end, and conferences and hearings have been held in connection with a direct application which has been made to the Federal Trade Commission for relief under the antitrust acts. At present the Bureau is working on some far-reaching plans for cooperative activity on the part of this Department and the lumbermen through their organizations.

In closing this portion of my report it ought again to be emphasized that the Bureau of Foreign and Domestic Commerce finds itself at a material disadvantage as respects the compensation of its office staff in comparison with the various commissions which have been created. These commissions have a comparatively free hand with reference to salaries because they operate so largely under lump-sum appropriations. The salaries paid by them average much higher than the statutory salaries which the Bureau pays. As a consequence, it is found that we are unable to get the desired men from registers of eligibles and are not even able to hold those of our force who happen to be particularly valuable to the commissions. The inevitable result follows that our men are tempted to accept places that pay more, and the time and labor put into training them for our work goes for naught. In cases of this kind, where, however unconsciously, Government services do actually bid against one another for men, the result is destructive to the services which are handicapped by statutory salaries.

This adds emphasis to the suggestion that these salaries should be made more commensurate with the value of the work done. There ought, however, to be a certain comity between Government services in this matter whereby one of them does not for its own

advantage work injury to another through taking its men away without notice. The subject is treated in another aspect under the Bureau of Standards.

Special Tariff Study Prepared for the Senate.

In response to a Senate resolution of January 17, 1916, there was prepared in the Bureau's cost of production division a report entitled "Foreign Commerce and the Tariff," which was subsequently published as Senate Document No. 366, Sixty-fourth Congress, first session. This pamphlet presents comprehensive statistics of imports and exports of foodstuffs, raw materials, and manufactured articles for a long period of years, traces the immediate effect on imports of changes in tariff laws, compares for many articles the ad valorem duty and the labor cost, and contrasts the growth in imports and exports of manufactures of the United States, the United Kingdom, Germany, and France. The period selected for analysis covers the 17 years from the fiscal year ended June 30, 1899—the first full year under the Dingley Tariff Act—to and including the fiscal year ended June 30, 1915. A supplementary comparison is made for the nine months October 1, 1912, to June 30, 1913, and from October 4, 1913, to June 30, 1914, this latter period beginning with the operation of the present tariff law and ending one month before the outbreak of the European war. Although this period was much too short to permit a fully satisfactory study of the effect of the tariff on imports or exports, the facts are clearly set forth and the tendencies indicated. Twenty-nine tables of detailed statistics enhance the value of this concise and significant report.

Examinations for Eligibles for Appointment.

Efforts to improve the personnel of the Bureau, both in the main office in Washington and in the field offices in the United States and foreign countries, continued along the lines adopted in the previous year. The examination system, consisting of a written test to which were admitted all applicants making out a prima facie case of fitness and an oral test before a board in Washington where the personal fitness of the successful candidates in the written examinations were passed upon, worked out very well. A noticeable improvement in the quality of appointments was achieved. During the year the United States Civil Service Commission examined 56 candidates for commercial attaché, 194 candidates for special agent, and 115 candidates for commercial agent. Fifty-seven candidates took oral examinations and 18

appointments resulted. In addition to these special examinations conducted by the courtesy of the Civil Service Commission, there were 10 regular civil-service examinations.

The widest kind of publicity was given to the special examinations and there was strong competition for practically every place in the field services. The Bureau received the hearty cooperation of the United States Civil Service Commission, the associations of manufacturers and other commercial organizations interested, the newspapers and trade press, and universities, colleges, and schools of commerce. Technical questions for examinations were in several instances prepared by the secretaries of associations, and assistance in correcting the examination papers was rendered by the officers of the associations, the editors of trade papers, and experts in the Bureau of Standards. The oral examinations which were conducted for the principal appointments were attended by experts from various Government offices. It is a feature worthy of note that many of the appointees were men who resigned from positions carrying higher salaries than those paid in the Bureau. It had become known that appointments were on the "best man" basis, and as a result there were high-grade applicants who would not otherwise have been interested.

BUREAU OF STANDARDS.

Functions of the Bureau.

The work of the Bureau of Standards is so individual, so differentiated alike in its character and its location from other Government services, yet so intimately wrought into the fabric of our progress, that it is fitting to explain its functions somewhat in detail and to point out how they bear on our national growth. It is a testing bureau for the Government. It is a national physical laboratory. It develops and establishes standards of weights and measures. But in doing these it does much more. It reaches out into every walk of life and may be truly said to establish standards which to a greater or less degree affect the life and work of every citizen in his domestic, professional, commercial, industrial, or scientific relations.

There are three important phases of this work. There is the solid foundation of research into the fields of precise measurements, of electricity, heat, light, chemistry, metallurgy, and into the whole subject of structural, engineering, industrial, and miscellaneous materials, including such as rubber, paper, textiles, and many others. There is the application of the results of these scientific researches to the help of all our industries, our public utilities, our railways, and to the operations of cities, States, and the National Government itself.

Also, there is the direct application of scientific research directly and indirectly to human life, to aiding the social advance of our people. This appears in its development of safety codes, such as the National Electric Safety Code, the National Gas Safety Code, and the continuing studies for the prevention of fire, both on land and water. It appears also in the popular scientific circulars, such as Measurements for the Household, soon to be followed by Materials in the Household, and this in its turn by Safety in the Household. This series of three pamphlets constitutes the most effective forward steps yet taken anywhere to bring the results of scientific research directly into the home. It is done in such a way that any household may have at its disposal in simple practical form the latest expression of the scientific study of all lands in all the past.

Again, the contribution of the Bureau of Standards to our social life appears in its studies of the safety of materials, especially those whose misuse or failure would involve danger to life. He would be bold indeed who would limit the present and future bearing of the work of this service on any form of human activities in this Nation. It cooperates with the sculptor in studying the composition of statuary bronze. It enters the brickkiln to advise on materials and processes there carried on. It produces the choicest of porcelains in exquisite colorings and glazes from new materials and aids in the construction of glass pots. It cooperates in the study of paper-making materials and in the application of new dyes. It joins forces with the electrotyper, the automobile engineer, and with those concerned in refrigeration. It provides safeguards against him who would deceive the humblest purchaser by a false weight or measure, and furnishes standard specimens to guide the largest industry. From the home to the greatest university, from the motor car to the railway system, from the mechanic at his bench to the largest operation of big business, its touch is constant, helpful, inspiring.

Its work in optics is not confined to the light visible to the eye. It has to do with mental optics as well as with the discovery and correction of industrial waste. It brings light where there was darkness before. I do not need to sound its praises. That is daily done by those the broad land over whom it has served. I merely express my deep appreciation of the public and social value of this great work and of the men who carry it on.

Technical Conferences at the Bureau.

A unique feature of the Bureau's work in a cooperative way is the system of technical conferences which are held almost daily throughout the year. At such conferences representatives of those interested in the subject of the conference participate in the discussions, thus giving a broad point of view conducive to the closer cooperation of all factors working for industrial progress. The Bureau has found these conferences to be of the highest value not only for their immediate practical results but for the mutual stimulus resulting from the interchange of experiences of the Bureau experts in their experimental researches and the engineering and industrial experts in the pressing problems of their work in the industries.

The value of such cooperation is mentioned here in order to emphasize the constructive work which is possible for the Gov-

ment to render to the industries and to science. By such methods the Bureau is rapidly becoming a coordinating center for scientific and engineering work. The Bureau unites the forces of physics and engineering in a manner which can not fail to be of the highest value to both, facilitating the rapid application of advances in one field to the needs of the other. A most urgent need to-day is for the more rapid assimilation of scientific progress by the industries. The lag between the publication of scientific results and their practical utilization in the industries must be reduced, and the Bureau of Standards, as shown in the pages of its annual report, aims to facilitate this in the various fields covered by its work. The system of conferences referred to is one of the most effective means to this end.

During the fiscal year 1916 the following societies held sessions at the Bureau of Standards: American Electrochemical Society, American Physical Society, Annual Conference of Weights and Measures (State, city, and national inspectors), Washington Chemical Society, and Washington Society of Engineers.

Cooperating committees or representatives of the following societies have met at the Bureau of Standards: American Ceramic Society, American Foundrymen's Association, American Institute of Metals, American Society of Refrigerating Engineers, American Railway Engineering Association, American Society of Civil Engineers, American Society for Testing Materials, National Electric Light Association, National Lime Manufacturers Association, National Scale Men's Association, Secretaries of Commercial Associations, Society of Automobile Engineers, and Society of Cotton Products Analysts.

Weights and Measures Conference.

The Eleventh Annual Conference on Weights and Measures was held at the Bureau of Standards on May 23-26, 1916. Twenty-one States were officially represented, and delegates were present also from the District of Columbia, Porto Rico, Philippine Islands, and 55 cities and counties. In addition there were 56 persons present representing manufacturers of weights and measures, railroads, etc. At this conference papers on important subjects affecting the work of weights and measures inspection were read and discussed, such as publicity, measuring pumps, industrial measuring equipment, national weights and measures week, methods of selling dry commodities, testing track scales, and specifications and tolerances of measuring devices. Important resolutions were passed,

and the specifications and tolerances were adopted. These are now recommended by the Bureau of Standards for adoption by the several States of the Union. Their early publication in final form will be of great value in unifying State legislation and local inspection practice on a basis approved by weights and measures experts. The fact should here be emphasized that ideal conditions as to uniformity of practice can not prevail until the National Government is given power by legislation to issue binding tolerances and specifications. This view is indorsed by the majority of State superintendents of weights and measures.

Cooperation With Weights and Measures Inspectors.

Some States have no State officials charged with the inspection of weights and measures. The local inspectors of such States apply to the Bureau for assistance, and the Bureau cooperates on the technical details of their work in every possible way. By this means the local inspectors are enabled to begin their work with a high standard in mind and with an efficiency which would otherwise be gained only after extended experience. In like manner newly appointed State superintendents of weights and measures apply to or visit the Bureau to obtain information as to the technical organization of their work and the selection of suitable equipment. Through the annual weights and measures conference such State superintendents are brought together at the Bureau to discuss the practical problems of their work. In this as in other fields of its work the Bureau serves as a clearing house of information and the means of coordinating and unifying inspection practice in all parts of the country.

Weights and Measures Testing.

A few examples may be selected to show the typical standardization work in progress at the Bureau. In the weights and measures division during the year, for example, there were tested 3,500 weights, 500 length standards for use in accurate surveys, 1,369 pieces of chemical measuring glassware, 1,138 hydrometers, and 1,200 automatic scales, 50 platform scales, and 325 track scales. Through such means the service of accuracy is furnished to the industries, since many of these measuring appliances regulate the manufacture of other measuring devices and regulate the accuracy of daily trade.

Of particular interest is the now thoroughly organized testing by two cars made for the purpose of railroad track scales in cooperation with the State and municipal weights and measure

officials, with weight masters, manufacturers, railroads, and Government departments. The work has been done during the year in 25 States. Of 325 scales examined, 61.8 per cent failed to meet the standard of accuracy set. A thorough technical report of the condition of each scale is furnished to all concerned. The Bureau cooperates with the inspectors, weight masters, and manufacturers in improving the methods of construction, maintenance, and operation of these scales.

Mechanical Standards.

The subject of industrial preparedness has emphasized the need for mechanical standards and the adequacy of the means for making and checking such standards. This work is an important part of the Bureau's function, but the present staff would be inadequate to handle it if the work is to increase materially. In view of the large appropriation made by Congress for providing systematically the gauges and measuring tools and other equipment necessary for this purpose, it is probable that the Bureau will be called upon to greatly increase this work.

The need for mechanical standards for materials has been brought many times to the attention of the Bureau within the year, particularly in regard to such products as screws, bolts, nuts, wire, and sheet metal. The diversity of the gauges and standards for such materials is confusing in the extreme, and it is very generally agreed, for example, that a single sheet metal gauge is highly desirable. The Bureau cooperates with the general movements for uniform standards, and it is clear that many engineers and manufacturers are prepared to make some sacrifice of individual preference in the interests of the widest possible uniformity of such standards. With the entrance of the United States into wider foreign markets of the world, the need for standards upon an international basis will be more and more keenly felt, and it need hardly be added that such standards would be less troublesome and less costly the sooner they are adopted.

Temperature Scale.

The temperature work of the Bureau of Standards is of special industrial importance. The establishment of the temperature scale from absolute zero to the highest known temperatures involves investigations in the scientific theory of temperature and heat measurements, laboratory researches of the most exacting nature, and refined apparatus which can be maintained only by continued standardization. The results of such work are applied

in almost every branch of science and industry. The temperature scale is maintained by certain fixed reference points, the fundamental being the freezing and boiling points of water. During the year an important fixed point for lower temperatures was determined, namely, the freezing point of mercury. The painstaking manner in which this was done resulted in an exceptional degree of accuracy, the results being expressed to thousandths of a degree Centigrade. The higher ranges of temperature are maintained by fixed points, such as the melting points of the metals and other chemical elements and compounds. During the year work was done on the sulphur boiling point, which is one of the fixed points used. The Bureau is about to issue standard heat samples, consisting of pure copper, pure aluminum, and pure zinc, the melting points of which are points that, in part, define the working temperature scale. With these samples the industries will be enabled to check the accuracy of the readings of their temperature measuring instruments.

Public-Utility Standards.

The Bureau's work in connection with public utilities, such as electric light and power, gas, and street railway and telephone service, includes scientific and engineering research, formulation of specifications or standards of practice, performance, and service, which may be briefly designated as "public-utility standards." The Bureau's publications on standards for electric service and standards for gas service, recently published, were prepared with the nation-wide cooperation of all technical interests concerned. Laboratory research, field investigations, expert questionnaires, conferences, and correspondence all contributed to the success of these documents. In developing standards for gas and electric service, the Bureau has rendered an invaluable service not only to the local utility commissions charged with regulating such service but to the gas and electric industries themselves by making available a national code specifying the conditions of adequacy and safety. The Bureau's work in these subjects will operate to reduce mortality and accidents, promote uniformity of engineering practice, and result in improved service to the general public.

In this connection a most important service rendered to the municipalities and the street railways of the country is the Bureau's researches in the laboratory and in the field on the effects of electric currents which cause corrosion of underground piping

and structures with serious property damage. The economic importance of the Bureau's system of electrolysis survey and remedial measures is realized by the corporations concerned, who express the keenest appreciation of the effective work of the Bureau in this field. Practical results of the Bureau's work are described in publications now available to those concerned. It may be added that the total cost of this work to the Government is justified many times over in the annual saving resulting from the installation of electrolysis mitigative systems suggested by the Bureau.

In the general investigation of public-utility standards, for which provision was made by Congress, the Bureau has investigated the extent to which telephone service may be adequately specified in the series of service specifications or standards. Much preliminary work will be required, both experimental and in actual service, and the heartiest cooperation is expected from both operative interests and the public, as the Bureau's work, as in the case of other public-utility standards, will be fundamental to the technical regulation of telephone service for the general work on public-utility standards. Some single States appropriate five to ten times as much as is available for the Bureau's work on this subject. The results obtained by the Bureau thus far have proved the economic value of expenditures for this purpose. It may be stated that the services required of the Bureau in this connection have far exceeded its capacity with the funds and staff now available.

Fire-Resisting Properties of Materials.

An important feature of the heat work of the Bureau has been the progress in the investigation of fire-resisting properties of materials. An example of such progress of particular interest is the installation during the year of the panel-testing equipment, in which full-size built-up walls and partitions may be tested to destruction and the failures studied scientifically with respect to temperatures and other conditions. The Bureau has cooperated with the Underwriters' Laboratories of Chicago and the Factory Mutual Laboratories of the Associated Factory Mutual Fire Insurance Companies, Boston, Mass., in conducting fire tests of building columns. The syllabus of proposed tests was submitted to hundreds of engineers and architects and the resulting suggestions used in preparing the final test program. The temperature-measuring equipment to be used in connection with the specially designed furnace will permit temperature changes in the structural

columns to be followed throughout the course of the fire test. The keenest interest is felt by all engineers concerned in structural work, and it is believed that the results of these tests will be of great importance in structural engineering and in fire-resisting construction. Incidental to this investigation is the technical study of building codes of the world. These codes govern the construction of houses and other buildings in cities. A basic study of the provisions of such codes will eventually result in the formulation of a standard building code. The Bureau's general researches upon structural materials make it appropriate that the formulation of this code should be undertaken in connection with its work on the fire-resisting properties of materials.

Many of the researches in heat and temperature measurements are of so highly technical a character that their significance is appreciated only by specialists in this subject. Such scientific work, however, is of fundamental importance in technical investigations such as just described, as well as in the control of the temperature conditions which vitally affect the efficiency of industrial processes in many industries.

Investigations of Materials.

The Director's annual report shows a large number of important investigations completed and in progress relating to the properties of structural, engineering, and miscellaneous materials. Some details will be found in the report, but reference is made here to several typical cases illustrating the value of this work. In the clay-products section of the Bureau leadless glazes have been developed which avoid the disastrous effects of lead poisoning in the pottery industries, methods of controlling the quality of clays were developed to such an extent that American clays may now be used in making pottery and porcelain ware which were formerly imported, and, furthermore, the Bureau has introduced scientific methods in the manufacture of clay products. Similar investigations of a fundamental character are in progress in the Bureau laboratory devoted to the subjects of cement, lime, stuccos, paper, textiles, rubber, paints, and similar industrial materials. In such work the Bureau selects the fundamental problems which can best be done in a Government laboratory where auxiliary equipment and technical experts in many lines are available. Special mention should be made of investigations which have proven of economic importance in the duplication of enamels for ironware, special kinds of imported papers, refractory materials, and optical glass.

Typical Investigations for the Industries.

The publication by the Bureau of various tables of densities emphasizes the commercial importance of the measurement of densities, particularly in checking the strength and controlling the purity of technical materials. During the year the Bureau computed and furnished density and volumetric tables for the United States Pharmacopœia, which publishes such standards for the use of the medical profession and the drug and chemical industries.

A scientific study of the theory underlying lubrication has been made, and an important contribution to the subject is that the ordinary laboratory test will not in some cases give the true viscosity of the lubricant. It need hardly be added that a scientifically correct theory of lubrication and a system of testing lubricating oils based thereon will be of great industrial value.

The Bureau's investigation of liquid-measuring pumps brought to light the important subject of the accuracy of such devices. The results of the Bureau's investigations made in the field and in the laboratory have been set forth in a Bureau publication which has just appeared. Short delivery was found to prevail in many sections of the country.

The Bureau has cooperated with the local inspectors in the interest of the users of gasoline and other products measured by such pumps. With the rapid development of new processes in commerce and industry, new problems are encountered which involve measurements and tests for which suitable methods or instruments are not available. In many cases the Bureau assists in developing such methods and equipments.

Standard-Barrel Act.

An act approved by Congress March 4, 1915, establishing standard barrels for fruits, vegetables, and other dry commodities went into effect July 1, 1916. The confusing effect on commerce of the manifold varieties of barrels used for various purposes will be remedied to a great extent, and the uncertainties of prices and quantity statistics will be greatly reduced as a result of this act. As the technical administration of this act will be in the hands of the Bureau of Standards, the Bureau has been active in studying the problem at first hand in the industries affected and rendering the utmost assistance, especially to the manufacturers, packers, and shippers of barrels, in meeting the requirements of the new law.

Optics.

The optical work of the Bureau has very direct technical applications. Fundamental researches have been completed on the wave lengths of light in the various portions of the visible and invisible spectrum of various elements. These values are as important in spectrographic work as the measurements of length in mechanical work. It may be added that such work has been found of value in the analysis of alloy steels, ores, and slags. The use of the spectroscope for quantitative analysis of metals is an unexpected and striking use of pure science in industrial and technical problems. The method is easier and more sensitive than chemical analysis, and the results show that accuracy will be possible when the subject has been more fully studied. Another application of pure science to the industries is the use of polarimetry in sugar analysis and in developing methods of grading samples by analysis. Disputes arose about a year ago between the buyers and sellers of low-grade molasses, and the Bureau served as referee, using optical methods in adjusting the basis of settlement. This branch of optics is known as polarimetry and is the basis for sampling and rating sugars and other products throughout the world. Many refined researches are necessary to place this work upon a precise basis and much of the fundamental work in this field has been done at the Bureau of Standards. Another optical problem of great importance is the standardization of colors and the development of satisfactory methods of color grading for various industrial products. The Bureau has recently developed inclosed standards which are relatively constant where the same materials exposed would change color within a short time. The conditions of reproducibility and definition of color have been studied, tests of color blindness conducted, and apparatus developed for applying the methods of color determinations. In the same laboratory specifications have been prepared for transparency and methods devised for measuring turbidity, and the expansion of materials with temperature has been determined optically with high precision.

Another branch of the optical work of special interest is the optical study of internal strains in glassware, particularly that designed for chemical work which is subjected to heat. A theoretical and experimental study of the errors of lenses has been made, and results will be published at an early date. The tests regularly performed by the Bureau for other departments, includ-

ing the Army and Navy, comprise such instruments as microscopes, photographic lenses, searchlight mirrors, periscopes, telescopes, projection lenses, and gun sights. The Bureau is serving as technical adviser in such matters to various branches of the Government service. An important branch of experimental research undertaken at the Bureau includes the most technical aspects of the subject of radiation. The Bureau has developed methods and completed researches upon the fundamental constants of radiation and constructed instruments from 10 to 20 times more sensitive than any previously constructed. These instruments are of practical service in researches in astronomy and in some cases in psychological laboratory work. The most direct application, however, of these studies of radiation is in standardizing the fundamental data involved in expressing the quality and intensity of radiation in a form suitable for computation. The practical applications extend to the measurements of high temperatures and the development of improved methods of producing artificial light.

Photometry.

The testing of incandescent electric lamps by the Bureau of Standards is a typical system of inspection and test used for all departments of the Federal Government. During the year about a million and a quarter lamps were inspected and tested under specifications prepared by the Bureau in cooperation with the lamp makers and Government representatives. The lamps are inspected at the factory by the Bureau inspectors, and samples are selected and submitted to life test at a specified efficiency in the Bureau laboratories. About 5,000 selected samples are burned on test annually. The methods used in this work have been carefully described in a Bureau publication just issued on the subject. The methods and apparatus devised at the Bureau have been of the greatest usefulness in the general development of the lighting industry. Interesting researches at the Bureau have been completed during the year upon problems involved in the new high-efficiency gas-filled tungsten lamps, in improved methods of measuring light, the study of the color factor in comparing lights from different sources, and the performance of gas-mantle lamps with various elements. In such cases the Bureau works in close cooperation with makers of various types of light sources, illuminating engineers, and gas and electric light companies, as

well as experts engaged in improving the methods of light production. On this phase of the Bureau's work it is felt that the Bureau could render service of a high economic value to the public in the better utilization of artificial light, and in many cases illumination could be greatly improved without increase in cost. The Bureau's publications on the subjects of gas and electric light, especially in the popular circular Measurements for the Household, have been recognized as being an excellent beginning in this direction. This instance is typical of almost every field of the Bureau's work which touches materials and appliances in general use by the public. The knowledge of their efficient use would go far toward promoting the general welfare by increasing safety, economy, and efficiency.

Magnetic Research.

A practical research of unusual interest has been completed after several years of painstaking work. This has yielded a method of determining the properties of irons and steels by magnetization. The magnetic properties exhibited bear a direct relation to the physical and mechanical quality and structure of these metals. Any flaw in the metal promptly shows itself in the graphic curve automatically plotted by the magnetic instruments used. A striking application has been made in determining the quality of steel rails and also of steel to be used for springs and knife blades. The results of the work have just been published by the Bureau and give promise of great practical value. The unique advantage of the method is that the magnetic method tests the whole amount of the material and not the surface only, and that it leaves the test piece unaltered so that the actual specimen tested may be used in a structure after the test has been completed.

Radium Research.

The increasing use of radium and radium products in medical work and for luminous preparations for watch and clock dials and in scientific research have accentuated the importance of the Bureau's work in standardizing the radioactivity of such preparations. Not having facilities for testing the radioactivity of specimens purchased, the buyer has formerly been helpless. Since the Bureau has taken up this work, however, the purchase price is based upon the strength certified by the Bureau of Standards, and the purchaser may demand a certificate from the Bureau.

Metallurgy.

The Bureau's work in metallurgy has resulted in a number of important practical publications. These cover such subjects as platinum, structural brass, pure iron, fusible tin boiler plugs, segregation in steel, pyrometry, rail specifications, etc. Much of this work is being done with the close cooperation of technical societies, such as the American Institute of Metals and the American Foundrymen's Association. The metallurgical work ranges from the quality of materials and the causes of failure to the temperature and other conditions for securing uniformity in the product. The Bureau has investigated the causes of failures of materials in large engineering enterprises, such as manganese bronze used in the great Catskill aqueducts, the tin used in the fusible boiler plugs, deterioration of tinned copper roofing of the Library of Congress, and failures of railway materials. Such failures lead directly to the most fundamental problems of the structure and reactions of metals under different conditions. Only by metallurgical investigations covering every phase of the subject can the quality of metals be theoretically controlled.

The question of outdoor statuary bronzes was submitted to the Bureau by the art commissions of New York, Philadelphia, and Detroit for the purpose of determining the most suitable chemical composition for such bronze and the requisite conditions for its care and maintenance. A systematic study will go far toward improving material and methods of preservation. Likewise the American Foundrymen's Association has submitted fundamental problems; for example, the standardization and testing of molding sands, uniformity of castings from the same ingot at different foundries, and similar problems. The metallurgical work includes the chemistry of the metals, their physical properties, their mechanical strength, and the important subjects of heat treatment and microstructure. The Bureau publications issued during the year on metallurgical subjects contain results of great value to metallurgical and metal industries.

Radio Communication Research.

Of particular interest is the cooperation of the Bureau of Standards with other Government departments in radio research and standards. The small appropriation made for this purpose has been very useful in extending this cooperation, and the new radio laboratory provided by Congress will offer facilities for still more effective work. The Bureau has designed and made instru-

ments suitable for the inspection work of the Bureau of Navigation, including auxiliary apparatus. An interesting and useful application which the Bureau is making of radio communication is in promoting safety at sea. For this purpose the Bureau experts have designed and constructed small radio sets as experimental installations in a lighthouse and in a lighthouse tender. This will enable the Lighthouse Service to render aid to navigation in a more effective manner than ever before. The Bureau fog-signaling apparatus is designed to automatically send out distinctive signals once each minute of short wave length which may be received by all ships within a few miles of the lighthouse. When used in conjunction with the new "direction finder" devised at the Bureau, ships will be enabled to get their bearings by radio communication at all times. This system of radio signaling would supplement the regular lighthouse service in time of fog and greatly assist in navigation. The direction finder referred to is a device of unusual importance. It replaces antenna and is small enough to use in an ordinary room. Trans-Atlantic signals have been received, and the direction of the sending stations are found with high accuracy. This is being adapted for use on battleships and aeroplanes and gives promise of the highest usefulness.

The Bureau has recently provided standard circuits for radio-calibration work for wave lengths up to 20,000 meters. This work involved the design of auxiliary apparatus of suitable types. In connection with the radio work above described the Bureau is undertaking numerous other researches in the various phases of radio work, and the practical results of such researches have already been highly gratifying.

By the bill approved July 1, 1916, an appropriation of \$50,000 was made for the construction of a new radio laboratory. The plans for this building are now complete. In preparing them the officers in charge of the radio service of the War Department and the Navy Department were consulted, and the building will be arranged for cooperative use by these services and by the Bureau of Standards.

Chemical Laboratory.

Work has progressed well upon the new chemical laboratory, which at the date of this report is fully inclosed. The work of installing the necessary equipment and furniture will proceed during the winter on the expectation of having the laboratory ready for use in the spring of 1917.

Saving Industrial Wastes.

An interesting example of the saving of industrial wastes has arisen in connection with paraffin paper. It was found that quantities of paraffin-paper scrap or paper stock containing paraffin paper were either destroyed or sold with difficulty and at a low price because the material was not available for further use by reason of the wax in the paper. No commercial process was known for removing this wax. The matter being brought to the attention of the Department by an interested manufacturer, it was referred to the Bureau of Standards. A sample lot of the waste material being supplied, a simple process for removing the wax and utilizing the paper stock was developed and put into practical operation. The Bureau has since issued a special circular letter upon this subject and has sent its expert to supervise the operation of the method recommended where the process has been installed.

Most of the work of the Bureau of Standards in materials has for its ultimate purpose saving waste in materials now used or now wasted because unused. Such materials include clay which by proper treatment can be made available for important uses; materials for making concrete; materials for paper making, including fibers and clays; the saving of unused materials in button making, etc. There are hundreds of cases annually in which manufacturing concerns write or send for specific information to apply in the improvement of processes, the saving of by-products, and the elimination of wastes. The Bureau of Standards could do a great productive work for the country that is badly needed if it had a special force and equipment to be devoted solely to this department of saving industrial wastes.

Recommendations.

Pursuant to suggestions made in my last report, an item has been included in the estimates for the fiscal year ending June 30, 1918, providing for the purchase of the strip of land on the north side of the present property of the Bureau, between that property and Van Ness Street, and also for securing the narrow strip of land between the present property of the Bureau and Tilden Street on the south side.

The increase in the operations of the War Department give emphasis to its repeated requests that the Bureau of Standards vacate the old arsenal buildings in Pittsburgh, which they have long occupied by courtesy for carrying on their structural-ma-

terial work. Although the funds available for these vital studies are barely sufficient to meet the needs of such testing as the Government itself requires, large equipment has been accumulated both in Pittsburgh and Washington, and more is needed. The work is one in which every citizen is interested, and it is essential that the large testing machines required should be provided and that these with the furnaces and other heavy apparatus necessary for the work should be assembled in a building designed for the purpose and of a sufficient size.

Accurate knowledge of the laws governing the behavior of girders used in bridges and other construction stops when we reach a moderate size. It can not be too strongly emphasized that our knowledge is as yet imperfect as regards the laws governing the action of large girders. We do not know certainly what we are about when we use them. There is too much guesswork—too little known fact. If we continue inaction on this important subject, some accident will, at sad cost, so disclose to everyone the limits of our present knowledge that we shall under the pressure of unhappy circumstances take the step which ought to be taken now. Foresight calls for prompt action on this subject. Hindsight will be rather apt to condemn those who fail of foresight to-day. I renew the quotation in my last report from the late Alfred Noble, one of America's most distinguished engineers:

The use of steel and concrete in girders in the construction of bridges and buildings is increasing rapidly. The calculations of strength of such girders are to a large extent based on theory, not well checked by actual tests; such tests as have been made were on small girders, and the value of the results in determining the dimensions of large girders, such as are now in common use, is doubtful. It is questionable whether, on the one hand, many structures in daily use are not perilously near the breaking point; or, on the other hand, whether the structures are not built unnecessarily massive and costly.

There is therefore great need of a large testing machine for actually testing the strength of girders of large size. Such a machine, operated under the direction of the Bureau of Standards, would soon repay its cost by inducing more economical and safer construction.

An item, therefore, is inserted in the estimates for the coming fiscal year providing for the purchase of a site for a testing laboratory for structural materials, for commencing the construction of a fireproof building, and for beginning work upon the large testing machine required for extending our knowledge of these vital matters beyond the present limits.

The recommendation in my last report that the scientific staff of the Bureau of Standards be increased to meet urgent conditions then existing is renewed and emphasized. For the past

three years there has been practically no increase in the statutory positions of the scientific staff. In the meantime, the calls upon the Bureau in connection with the scientific work of the country, and especially the industries, have grown by leaps and bounds. The demand on the part of the industries for accurate and reliable scientific data has never been as great or as important as at present. This demand is a rapidly increasing one." The growing prosperity of the country, the establishment of new industries, the growing demands of our manufacturers for scientific knowledge and for the aid of the service have added to the serious handicap under which the Bureau labored a year ago. As things now are, it is a hopeless task for the Bureau of Standards to meet the demands upon it. If things remain as they are, much of the work for which it was created must be left undone and much of the help our industries require can not be extended. I therefore have approved the request of the Director of the Bureau of Standards that items be inserted in the estimates for the coming fiscal year which shall add a sufficient scientific staff to cope with the existing demands and which shall provide such further small additions to the clerical and mechanical staff as are required for the same purpose. It is evident that the completion of the new chemical laboratory will itself call for a considerable addition to the staff.

Never has the demand for scientific and technically trained men been as great as at present. This has resulted in the loss of many well-trained men in the Bureau's staff. The time has come when some of the salaries paid such experts must be increased or their services dispensed with. This can not be done without a loss in quality and the deterioration of the high standard of the Bureau's work.

The testing and investigational work of the Bureau is greatly handicapped by the lack of sufficient instrument makers and mechanics. Estimates will be submitted for additional assistance of this kind.

I renew my request of last year for an assistant to the Director, for an editorial clerk, and for a property clerk. No private business of similar size would think of hampering its head with minor details of administration which prevent giving needed time and attention to the large problems that daily arise. If the work of the service is to go on as it should, these three posts should be promptly created and filled. The property of the Government

in the large group of buildings occupied by the Bureau has no proper custodian to-day and can not have one until the property clerk now requested is provided.

Increases in Special Funds.

Increases are urgently needed in several of the special funds under which the Bureau is carrying on important work. The structural-material fund is barely sufficient to care for the testing work of the Government service. It should be increased by at least 50 per cent, in order that the Bureau may undertake more investigational work needed by the Government service and by the public. The importance of this work can hardly be overestimated, not only from the standpoint of economy and efficiency in the structural work of the Government, but from that of the efficient and economical use of these materials on the part of the public.

The Bureau's work in connection with public utilities has proven of the utmost importance. The fund available is insufficient to cover more than two or three problems. The present appropriation might well be increased several fold. It would meet with the hearty approval of all public-service and municipal bodies having to do with the regulation of public utilities. It would contribute greatly to better service on the part of public utilities, as well as to the conservation of life and property.

The enormous annual loss of property by fire emphasizes the great necessity for a better knowledge of the fire-resisting properties of materials and construction. To be of value, such work must be carried on on specimens commensurate with those used in practice. The Bureau's work in this direction has been well organized and much of the apparatus constructed. However, funds are needed for additional equipment as well as materials upon which to work, which in such cases are necessarily expensive; therefore, this fund should be increased by at least 50 per cent.

The fund available during the present year for the investigation of mechanical appliances is not sufficient to meet even the needs of the Government service. Here again, as in the purchase of materials, the Government is purchasing machinery and all sorts of devices in accordance with carefully prepared specifications, and suitable tests are made before their acceptance. The standards of performance in such cases and the methods of measuring the same are equally important to the manufacturer and to the public. This fund should be increased to at least double its present amount.

In general it has been thought best to submit only such estimates as are urgently needed to care for present work rather than to enter new fields. However, two exceedingly important cases have arisen for which estimates will be submitted. The first is that of optical glass. Notwithstanding the importance of this material in the construction of all sorts of optical instruments, it has not yet been successfully manufactured in this country in any considerable quantity. Every effort should be made to assist in the development of this industry. Estimates will be submitted for a special fund intended to enable the Bureau to undertake the important underlying scientific work needed in the production of optical glass.

The second case is that of electrodeposition of metals. Many industries are vitally concerned in the fundamental principles of the electrodeposition of metals, as, for example, the electrotyping and electroplating industries. Little attention has been paid to the underlying scientific principles involved. Such information is urgently needed; therefore, an estimate will be submitted for this purpose.

New Power Plant.

A new power-plant building has become an urgent necessity. The total boiler capacity of the present plant is already seriously overloaded, and the danger of operating with no reserve in case of breakdown is apparent. The electric generating units are in good condition, but should be moved to a new location to relieve the present crowded conditions. Repairs can not now be made with requisite facility, and many lines are inaccessible for repairs. Extension of switchboard space is impracticable in the present location, and for this reason much objectionable and unsafe construction has had to be permitted. The space vacated will be admirably suited to purposes of a general shipping and store room, which is also badly needed.

Policy as to Personnel.

Transfers from the scientific services of the Department to other Government and to private scientific services should be by mutual consent. The Bureau of Standards is constantly embarrassed because its men are tempted away by other Government services and by private concerns. The Bureau is willing to transfer its men either to improved positions in other Government departments or in private life, but thinks it proper that it should be so treated in the matter that its own work shall not be

thereby suddenly and seriously interrupted. In particular, it feels that other Government services should not without notice or consultation take its officers away from the duties for which they have been specially trained without giving it opportunity to prepare for the change. The Bureau of Standards is always ready to take in men and train them for any particular research work within its scope that is desired. Some large industries and railroad companies and some Government services take advantage of this. At present, however, the custom (for it is no less) of tempting its men away by privately offering them higher salaries, without consultation of the Director of the Bureau or without any notice of any kind to him, is one that works serious harm to the public through the stoppage of important scientific work and frequently also works out a serious injustice to the individuals concerned.

I renew the suggestion in my last report respecting the relative treatment by the Government of its scientific, its naval, and its military staffs. The latter, after being educated at great public cost, are assured permanent employment and are given a retirement privilege affording protection in their old age. This is proper and admirable. It is quite improper, however, to restrict it to these particular public servants and to refuse it to others quite as worthy. The scientific staff of the Government is, to say the least, no less productive. The members of that staff give their lives to the country quite as truly unless the Government so ill rewards them for their services that individuals can afford to pay them better.

There is the closest cooperation between the scientific force and the officers of the naval and military establishments, yet the man of science, whose work is embodied in the battleship, in the wireless telegraph, in the explosive, pays for his own education, has no certitude of employment, and can look forward to no protection when he is old. If he wishes the same security that the officer of the Army or Navy has, he must look elsewhere than to the Government for it. Serve he the Government never so faithfully, it extends to him no hand of helpfulness. When our young scientific men leave college after acquiring an education at private cost, they start work in our laboratories at \$1,000 or \$1,200 per annum, which makes an interesting comparison with the pay given, for example, at the Naval Academy, plus a free education. If a young scientific man enters our service at \$1,600, it is us

because he has spent his own money and time acquiring some special degree in a university and thereby enhancing his value to the public. In a service like the Coast and Geodetic Survey men give their best years to working in remote parts of the United States, Alaska, and the Philippines, must go to sea in small vessels, and at the risk of storms and unknown dangers provide safety for the lives and property of others by surveying waters for the first time. They also must give up home life and endure hardships and dangers at least equal to those which a military service requires. It is not just that with equal education and productiveness, assuming similar risks in their country's service, they should receive unequal treatment. The scientific staff of the Bureau of Fisheries directly aids in discovering new foods and in making them available for mankind. Whole industries also depend upon the fruits of their labors. Yet they receive a similar lack of recognition at the hands of the public. The practical attitude of the Nation toward the men of productive science is the reverse of that which it holds to the trained officers, soldiers, or sailors. All these men are useful, unselfish public servants. There is no thought of preferring one to another. The comparison is between the way in which the Government treats the one and the other and between the way the scientific men are welcomed in our industries, in our universities, and in Government services. The men of science in the Government employ do the work on which our economic structure and our industrial processes in large part depend. They do not receive a sufficient reward.

BUREAU OF THE CENSUS.

During the fiscal year the Bureau of the Census compiled and published a considerable part of the primary or fundamental statistics based on its latest canvass of manufacturing industries and carried on the compilation of more detailed statistics for later publication; conducted its regular annual inquiries relating to mortality, to municipalities, and to cotton and cottonseed; prepared and published the Official Register of the United States; completed the preparation of a report on the blind and brought well toward completion one on the deaf; made semiannual collections of statistics relating to stocks of leaf tobacco; issued a set of tables showing expectation of life for various classes of the population; carried on the compilation of a monograph giving detailed statistics relative to deaths from cancer; prepared estimates of population for States and municipalities; took special censuses of four cities and towns; and complied with many requests for information contained in its records.

CURRENT AND COMPLETED WORK ON STATUTORY INQUIRIES.

Census of Manufactures.

The field work on this investigation, which related to the calendar year 1914, and was made as of December 31, 1914, was completed early in the fiscal year. The compilation and publication of the primary or fundamental statistics based on the inquiry were brought well toward completion during the year and have been finished since its close. The work could have been completed sooner and at less cost if manufacturers throughout the country had responded more promptly and carefully to the request of the Director of the Census for the information required by law. After the reports had been secured, it was found necessary to return many of them to the manufacturers for correction and verification; in some instances this had to be done two or three times. On the other hand, the thanks of the Department are extended to those many manufacturers who by filling out and transmitting over 50,000 schedules in correct form permitted my requesting the Senate Committee on Appropriations to reduce the amount of the sum allotted for the cost of the manufactures census by \$40,000.

The statistics relating to all manufacturing industries combined, for the entire United States, were sent to the printer on July 24, 1916—an earlier date, relatively to the period covered by the inquiry, than that at which the comparable figures for any preceding similar census had gone to press and fully two months earlier than the corresponding date in the case of the last preceding census, that of 1909. These statistics show that the total number of persons engaged in manufactures increased from 7,678,578 in 1909 to 8,265,426 in 1914, or by 7.6 per cent, and that the gross value of products increased from \$20,672,052,000 in the earlier year to \$24,246,323,000 in the later, or by 17.3 per cent.

The remaining work in connection with this census will consist in the preparation of the analytical tables and the text for the final reports, which will comprise an abstract in the form of an octavo volume of about 500 pages and three or four large quarto volumes of approximately 1,000 pages each. (See recommendation relating to "Intermediate census of manufactures," under "Legislation needed.")

Vital Statistics.

The work on the report Mortality Statistics, 1915, is progressing satisfactorily, and the copy will probably be in the hands of the printer by December 1, 1916. A preliminary statement, in the form of a press summary, giving the number of deaths and the death rate for each registration State and each city of more than 100,000 population, has already been issued.

The work on the report Birth Statistics, 1915, is also progressing in a satisfactory manner, and the copy will be sent to the printer at about the same time as that for Mortality Statistics.

The census reports presenting vital statistics are, from year to year, being brought to a higher standard of usefulness. The registration of deaths—which, under the Constitution of the United States, is necessarily a function of the State and municipal authorities—is constantly becoming more nearly complete, the registration area having been extended until it now contains about 70 per cent of our total population. Until recently the birth-registration systems of the States and municipalities were in most cases so inadequate that the Census Bureau did not compile and publish birth statistics. Now the collection of such statistics has also been begun; and it is expected that the registration area for births, which at present contains more than 32 per cent of the population

of the country, will, like the death-registration area, be extended from year to year.

(See also "Life tables" and "Monograph on cancer," under "Special and miscellaneous lines of work.")

Financial Statistics of Cities.

The annual report presenting financial statistics for cities of more than 30,000 population, relating, in the case of each city, to its latest fiscal year terminated prior to July 1, 1915, was completed and sent to the printer in January, 1916, less than seven months after the close of the period covered. This report, which fills 338 pages, presents detailed statistics relating to revenues, expenditures, indebtedness, assessed valuation, and value of municipal properties. The Bureau's classification of municipal financial statistics has received the indorsement of the leading civic organizations of the country, and is now followed to a greater or less extent by many of the cities having more than 30,000 inhabitants.

General Statistics of Cities.

The report on this inquiry, which also referred, in the case of each municipality, to its latest fiscal period ended prior to July 1, 1915, related to the subjects of governmental organization, police departments, water-supply systems, and liquor licenses and taxes. It was completed and sent to the printer in November, 1915, five months after the close of the period covered. The demand for this report has been so great as to require a reprint.

The 1916 report on general statistics of cities will present detailed data in reference to recreation facilities, such as park areas and buildings, organization of park administration, playgrounds and athletics, baths and bathing beaches, zoological parks and collections, music and entertainment provided by the city, art galleries, museums, etc. Practically all the data for these subjects have already been collected, and their compilation is well under way. The report will probably go to the printer in November, 1916.

Cotton and Cottonseed.

During the year the Census Bureau gathered and published statistics relating to cotton ginned, consumed, imported, exported, and on hand, to active spindles, and to cottonseed and linters. A total of 26 reports, in the form of post cards, were issued during the year, and in addition an annual bulletin was published.

Under the authority of the act of Congress approved August 7, 1916, the Census Bureau will hereafter collect and publish monthly statistics relating to cottonseed crushed and cottonseed products manufactured and to imports and exports of cottonseed and its products.

The same act authorizes and directs the Census Bureau to collect and publish, at quarterly intervals, statistics of raw and prepared cotton and linters, cotton waste, and hull fiber consumed in the manufacture of guncotton and explosives of all kinds and of absorbent and medicated cotton. The first publication of these statistics will cover the entire calendar year 1915.

Tobacco Stocks.

The collection and publication semiannually of statistics relating to the quantities of leaf tobacco held by manufacturers and dealers have been carried on in accordance with the provisions of the act of April 30, 1912. Under authority contained in a provision of the act approved May 10, 1916, these statistics will be gathered and issued at quarterly intervals, beginning with the report for October 1, 1916.

The act of May 10, 1916, provides "that hereafter there shall be in the official organization of the Bureau [of the Census] a separate, distinct, and independent division called the Division of Cotton and Tobacco Statistics," and the same act also provides an appropriation "including \$15,000 for collecting tobacco statistics authorized by law in addition to any other fund available therefor." Definite arrangements have been made for putting into effect the above provisions of the act.

Negroes in the United States.

The decennial report on Negroes in the United States is nearly completed, and a large part of it is already in type.

The Blind and the Deaf.

The decennial report on the blind population in the United States was completed and that relating to the deaf population was nearly completed during the fiscal year. Both are in the hands of the printer.

Prisoners and Juvenile Delinquents.

The work on the decennial report relating to prisoners and juvenile delinquents was well advanced toward completion during the fiscal year and will soon be in the hands of the printer.

Estimates of Population.

The preparation of a bulletin presenting midyear estimates of the population of States and cities for the years 1910 to 1916, inclusive, was practically completed during the fiscal year and has since been sent to the printer.

SPECIAL AND MISCELLANEOUS LINES OF WORK.**Life Tables.**

One of the most important of the special lines of work undertaken by the Bureau was the preparation of a series of tables showing expectation of life for various elements of the population in certain States. These tables, compiled under the supervision of Prof. James W. Glover, of the University of Michigan, are similar in scope and manner of presentation to those issued by life insurance companies, but differ from the insurance tables in that they relate to the entire population of the area covered instead of being confined to risks selected through medical examination and otherwise. A similar set of tables, based on data covering a greater period of time, have been computed and will be published before the end of the current fiscal year. In the report presenting these tables will be given the original data on which they are based, together with an explanation of the methods employed in computing them.

Monograph on Cancer.

A monograph has been prepared and will soon be published in which are presented, in much greater detail than in the annual mortality reports issued by the Bureau, statistics in relation to deaths from cancer.

Financial Statistics of States.

A report on this subject, similar in scope to the Bureau's annual reports giving financial statistics of cities, was prepared and published. This report, which related in the case of each State to its latest fiscal year ended prior to July 1, 1915, was the first ever published in which the statistics pertaining to revenues, expenditures, indebtedness, assessed valuation, and State properties were given in so great detail. It aroused much interest among State officials, who are desirous that the investigation be made an annual one. (See recommendation relating to "Financial statistics of States," under "Legislation needed.")

Occupations and Child Labor.

Work was done in preparation of supplementary statistics of occupations, showing certain details not brought out in the general report on occupations, which formed one of the Thirteenth Census series. These supplementary occupation figures will include data relating to child labor. This work was suspended from October, 1914, to October, 1915, in order to provide as large a force as possible for the work on the current census of manufactures.

Special Censuses of Population.

Special censuses of the population of the following-named municipalities were taken at local request and expense: Highland Park, Mich.; St. Clair Heights, Mich.; Hastings, Nebr.; and El Paso, Tex.

Assistance Rendered Other Departments.

Lists of names and addresses of large manufacturing establishments, about 30,000 in number, were furnished the Secretary of the Navy for use in organizing the industries of the country in furtherance of the plans for military and naval preparedness. Lists of this character were also supplied to the Department of Agriculture and the Federal Trade Commission for use in connection with the activities of those offices.

In this connection it should be noted that the law respecting the confidential character of data collected by the Bureau of the Census is of so rigid a character that the Department is without authority to permit other Government departments to refer to the Census records and files even when the information is sought solely for Government use. The provision of the law on this subject reads, "nor shall the Director of the Census permit anyone other than the sworn employees of the Census Office to examine the individual records." It is in the highest degree proper that the confidence reposed by the business public in the inviolable character of the information given to the Bureau of the Census shall in no smallest respect be shaken. On the other hand, it is going very far to rigidly forbid the use of this information by other Government services who desire to apply it to strictly confidential public uses, as, for example, the determining of the manufacturers who are prepared to do work forming a portion of the national defense. It would seem practicable to place when necessary the employees of other Government departments under oath, as those of the Census are, and then upon proper written assurance of the confidential nature of the purpose for which the information is

required to permit its use by other Government departments when the good of the public required it.

The Federal Trade Commission has by reason of this law been obliged to undertake the collection of information at great labor and expense for confidential public purposes when much if not all of the information was in public records in the same building but was unavailable by reason of the law.

PLANS FOR FUTURE WORK.

Transportation by Water.

The preliminary work on this inquiry, which, under the law, is made at decennial intervals, was begun before the close of the fiscal year. The actual collection of the statistics, which will relate to the calendar year 1916, will commence early in 1917. By reason of the very great increase which has taken place in the number and tonnage of American-owned craft engaged in foreign and domestic commerce, and of the changes that have been made in the methods of conducting the business of water transportation, this investigation is one of especial interest and importance. Its scope will be extended, as compared with that of the 1906 inquiry, so as to cover the shipbuilding industry and the operations of fishing vessels.

Religious Bodies.

The census of religious bodies, like the water-transportation inquiry, is, under the law, made at decennial intervals, and the forthcoming one will relate to the calendar year 1916. The report will present, for each religious denomination, detailed statistics in regard to church membership, church property, number and salaries of ministers, Sunday schools, etc.

Marriage and Divorce.

A joint resolution is now pending in Congress which, if adopted, will authorize the Bureau of the Census to make an inquiry in regard to marriage and divorce covering the period from 1907 to 1915, inclusive, and at annual intervals thereafter. In case this investigation is thus authorized, the field work will begin within a short time after the adoption of the resolution.

Monograph on Tuberculosis.

A statistical monograph on deaths from tuberculosis covering the calendar year 1916 will be prepared and published. This monograph, like that relating to cancer (see "Monograph on

cancer," under "Special and miscellaneous lines of work"), will present much more detailed statistics than are given in the Bureau's annual reports on mortality.

Electrical Industries.

This inquiry, which, under the law, is taken at quinquennial intervals, covers central electric light and power stations, electric railways, and telephones and telegraphs. The forthcoming investigation will relate to the calendar year 1917, and, although the field work can not begin until after the close of that year, the preliminary office work will commence in the latter part of 1917. The quinquennial census reports in regard to electrical industries, begun in 1902, present a complete history of the development of these industries, which has been such an important factor in the industrial progress of the United States.

Executive Civil Service.

A bulletin presenting statistics in regard to the employees in the Federal service on July 1, 1916, will be compiled and published. The Census Bureau has already issued two such bulletins, the first relating to the year 1903 and the second to the year 1907.

Census of City Distribution.

Under my direction the Bureau of the Census is planning an inquiry in one or more cities into that portion of the cost of distribution which arises from cartage and hauling. There are three elements in the full act of transportation—the cartage element, the handling element, and the hauling element, using the latter to mean actual transportation by rail or water. Of these, the last is often the least and by comparison with the others small, though it is the phase which has occupied almost the whole public attention given to the general subject. Again, the first, or the cartage, element is frequently the largest of the three and probably is the largest single element in the entire cost of distribution. It seems probable that it amounts to a great deal more, possibly many times more, than our total annual freight charge. It is a remarkable thing that we allow ourselves to remain in ignorance of this matter. There have been made here and there sporadic attempts to get some information on the subject, but nothing continuous and conclusive has been done. The little that has been learned shows, however, that the problem is larger than is supposed. It has been indirectly attacked by the development of the automobile truck and by the making of improved roads,

but this has all been done without any clear knowledge of the size and weight of the problem to the solution of which it in some measure contributes. The Office of Public Roads and Rural Engineering of the Department of Agriculture has thrown more light upon this subject than is known to have come from any other source. It is hoped that the facts to be developed by the preliminary inquiry of the Bureau of the Census will lead to a thorough knowledge of this almost unknown but vital phase of the cost of living and so to adequate future treatment of it.

LEGISLATION NEEDED.

Intermediate Census of Manufactures.

Under existing law a census of manufactures in the United States is taken every fifth year. Since the close of the year 1914 conditions have so changed that the statistics for that year are no indication of the facts for 1916. There is constant demand for data concerning the annual output of our domestic manufactures at more frequent intervals than every fifth year. A census showing the annual gross value of the products of domestic manufactures and the quantity of some of the principal products could be taken very expeditiously and at small cost and would be of great value. This census need not include statistics of capital, persons employed, quantity of power used, or various other details covered by the regular quinquennial census of manufactures. The inquiry could be confined to the gross value of all products and the quantities and values of the principal ones. The purpose would be to compile and publish these statistics in time to be of current interest and value. This "intermediate census" of manufactures is greatly needed.

It is, therefore, recommended that legislation be enacted authorizing the Director of the Census to take an intermediate census of the quantities and values of domestic manufactures on the above-described basis for 1916 and for every fifth year thereafter.

Forest Products.

In my last report I recommended the enactment of legislation providing for the annual collection of statistics of forest products. Bills having this purpose (S. 4589 and H. R. 12417) are now pending in Congress. Statistics of this character should be collected and published regularly, since they indicate very closely the extent to which the forests of the country are being depleted for commercial purposes,

Financial Statistics of States.

A report presenting, for the fiscal year 1915, financial statistics of States, similar in scope to the financial statistics of cities now issued annually by the Bureau, has been published. This report is the first of its kind which the Bureau has compiled, and State officials are desirous that the investigation be made annually hereafter. Legislative authority will be necessary, however, for the continuance of the work, and bills to provide such authority (S. 4589 and H. R. 12417) are now pending in Congress. The enactment of one of them into law is recommended.

Official Register.

The changes in the scope of the Official Register which are recommended in the annual reports of the Director of the Census for the fiscal years 1913, 1914, 1915, and 1916 should be authorized by law.

Express Business.

I renew the recommendation contained in my last annual report for the repeal of the requirement of the decennial collection of statistics relating to the business of express companies, now contained in the act of June 7, 1906. Annual statistics of this character are collected and published by the Interstate Commerce Commission, and the decennial conduct of a similar investigation by the Census Bureau is wholly unnecessary.

Special Statistical Compilations.

I also renew the recommendation contained in my last report to the effect that express, rather than implied, authority be given the Director of the Census to furnish transcripts of tables and other records and to prepare special statistical compilations for State and local officials and for private concerns and individuals, and that the provision of law conferring this authority be so drawn as to make the amounts received for work of this character actually serviceable to the Bureau instead of only nominally so as at present. The authority under which the Bureau now performs this work is found in section 32 of the Thirteenth Census Act.

OFFICE FORCE.

The appropriation act for the fiscal year 1916 provided for 569 permanent officials and employees of the Census Bureau. The number provided by the act for 1917, under which the Bureau is now operating, is 562, seven employees having been transferred by that act to the roll of the Office of the Secretary.

In my last report I set forth in some detail the manner in which the Census Bureau is handicapped by its low average salary scale, which has driven many of its more capable employees to resign in order to accept more lucrative employment elsewhere, both in and outside the Government service. The appropriation act for the current year afforded some measure of relief by providing 13 additional positions in the salary classes above \$1,200 per annum, the number of \$1,200 places being correspondingly reduced. The scale of compensation still remains low, however, when comparison is made with many other Federal offices; and in order to bring its average more nearly to the level prevailing elsewhere it is the intention to ask Congress for a further increase in the appropriation—an increase which, though representing but an insignificant fraction of the total amount appropriated, would make possible a number of sorely needed promotions to the salary classes above \$1,200. When once the compensation paid in the Bureau of the Census is on a par with that paid elsewhere for comparable work, the Bureau will be able to retain the services of its abler employees—or at least of most of them—instead of losing them to other branches of the Federal service and to the commercial world.

The Bureau also suffers by reason of the inadequate size of its statutory force, which now numbers 562, whereas 10 years ago it was 649, or 87 more than the present number. A portion of this reduction (39 employees) was due to the removal of the Census Bureau to the Commerce Building and the resultant consolidation of a part of its force with that of the Department. Making allowance for this consolidation, the Bureau is now operating with 48 fewer employees than it had 10 years ago. Its work, however, is materially greater at present than it was at that time, by reason of the recent addition of the semiannual (now quarterly) tobacco inquiry to the investigations regularly carried on by the Bureau, and also because of the general increase of the work along all lines, due to the growth of the country during the past decade. It is a fact, therefore, that the Bureau of the Census is doing more work to-day with a smaller force than it did 10 years ago. The Bureau has been able, by improvements in methods and mechanism, to neutralize in part the effects of this condition, but the handicap under which it labors is still a serious one.

In the annual report of the Director of the Census is given a statement showing the nature and distribution of the office and

field forces of the Census Bureau on September 30, 1916. The following is a summary of these forces on that date:

Officials.....	18
Clerical force.....	528
Subclerical force.....	18
Mechanical laboratory force.....	11
Special agents.....	19
Total	594

In addition, there are employed throughout the cotton belt 725 local special agents to collect statistics of cotton. These agents perform their work only at intervals and are paid on a piece-price basis.

EQUIPMENT.

Preparation for the Census of 1920.

In respect of tabulating machinery, a great deal of work is necessary in preparation for the Fourteenth Census, to be taken in 1920. Reference is made to the full treatment of this subject on pages 94 to 96 of my last annual report. The sum of \$25,000 was granted as the first of four annual installments requisite to bring the work of the mechanical laboratory up to the standard required for the work of the Fourteenth Census. A second installment of \$30,000 is inserted in the estimates for the coming fiscal year. If the appropriations for the laboratory continue adequate, it is planned to have the entire machine equipment completed and thoroughly tested by July 1, 1919—the beginning of the Fourteenth Census period. With this end in view, a progressive plan of work has already been begun. This includes the construction of 25 new-model tabulating machines, complete, and of 5 extra tabulator bases and 114 extra counting units of 10 counters each; the rebuilding of 286 automatic card-punching machines and of 2 card-sorting machines; and the overhauling of 17 card-sorting machines and of 5 card-counting machines. This work, together with the maintenance of the machinery in daily use, will tax the capacity of the machine shop between the present time and July 1, 1919.

An estimate, in the sum of \$50,000, is submitted for the purpose of developing an "integrating" counter. This counter will be of the utmost value in the statistical work of the Government, because it will make possible very much quicker and more accurate addition of figures representing factors making up the statistical data published by the Government. It will be used in connection with the tabulating machines which have been developed and perfected by the Bureau of the Census.

STORAGE SPACE.

The matter of storage space for the Bureau's old records is steadily becoming more serious. These records consist in large part of population, agricultural, and manufactures schedules—that is, the returns made by the enumerators—of past censuses. Some of them, especially the population schedules, contain information of great value to genealogists, applicants for pensions or increases of pensions, litigants, and others, and their destruction would mean irreparable loss.

At present these schedules are stored in four places—the eighth floor of the Commerce Building, the fireproof vault in the basement, a portion of the basement outside the vault, and the old Armory Building in the rear of Poli's Theater.

One end of the vault is next to the boiler room, and all the steam pipes for one side of the building pass through it. For this reason the temperature—although the windows are left open and the steam shut off from the radiators—can not be kept below 90° Fahrenheit while the heating plant is in operation. It is, therefore, impossible for a clerk to work in the vault, and particularly in the end next to the boiler room, for more than a few minutes at a time, without much discomfort and inconvenience; and the records are rapidly deteriorating because of the heat, in spite of the fact that a large number of buckets of water are kept standing in the vault in order to moisten the atmosphere.

The roof and walls of the old Armory Building are leaky, and some of the records there have already been so badly injured by the rain that portions of them are obliterated.

The Census Bureau is, therefore, in extremely urgent need of additional storage space for its records.

The serious crowding arising from the presence of the Federal Trade Commission in the Commerce Building has continued throughout the fiscal year. Application has been made by the Census Bureau for over 4,000 square feet of the space which it is expected the Federal Trade Commission will soon vacate.

BUREAU OF INSURERS.

The important and manifold functions of the Bureau of Fisheries have been extended during the year, new achievements in behalf of the public are recorded, and plans for enlarged usefulness have been perfected. The forty-fifth anniversary of the establishment of the Bureau was celebrated on February 9, 1910, with public exercises, at which a bronze memorial tablet to the founder and first Commissioner, Spencer Fullerton Baird, was dedicated. Later it was suitably placed in the building of the Bureau of Fisheries. The service sustained a severe loss in the death of Robert D. Johnson, assistant director of the Division of Fish Culture since September 1, 1906, and an employee of the Bureau of Fisheries since 1887. Mr. Johnson was succeeded by Harry C. Malley who has been in the non-political service of the Bureau since 1897 and has held the post of fish superintendent in charge of Pacific coast pisciculture since 1907.

SECRET. ADDITIONAL: 1 OF 25. SECRET.

The above described and illustrated new book of mine, "The Secret
 World of the Community," will be published by the American Book Company, Inc.,
 100 West 11th Street, New York, N. Y. It is a small, pocket-sized
 book, of about 100 pages, and is written in a simple, straightforward
 style, and is a most valuable and interesting book. It is a
 book that will be of great interest to all who are interested in the
 community, and it is a book that will be of great value to all who
 are interested in the community. It is a book that will be of great
 interest to all who are interested in the community, and it is a book
 that will be of great value to all who are interested in the community.

Bureau withdrew from the campaign with the fishery established and the demand for the new food created. The progress of the fishery has been extraordinary. It centers as an established industry in New York, in which port as many as 13 different vessels have landed tilefish in one month. Tilefish bears shipment well and is sent all over the eastern half of the country. Some large lots have gone as far as Kansas City. It is a regular commodity in the markets of the eastern cities and a usual item on the menus of hotels, restaurants, and clubs, besides finding general use in private families. An important feature of the fishery is that it is conducted at all seasons of the year, and vessels are now engaging in it at times when they would otherwise be idle.

After years of discussion the present Congress provided means for relieving the fishermen, particularly those on the Atlantic coast, of losses sustained through the ravages of dogfishes. These fishes, which are small sharks, have hitherto had little economic value and have been regarded as a serious nuisance. They come in great droves and do vast injury to the fisheries by destroying nets and lines, consuming bait, and eating or mutilating other food fish that have been caught with hook or net. They have been a menace. It is the purpose of the Fisheries Service to make them useful and to substitute a profit from them for the losses they have hitherto caused.

On June 21, 1916, an act was approved appropriating \$25,000 to enable the Commissioner of Fisheries to conduct investigations and experiments to ameliorate the damage done by the dogfish and other predaceous fishes. Work under this law has made notable progress. No feasible method of exterminating dogfishes or of seriously reducing their numbers is known. The task before the Service has been to change a useless article into a useful one; to make an asset out of a loss. Dogfishes have a known food value appreciated and utilized in other countries, but here ignored. While we curse them, others eat them. They are edible fresh, salted, smoked, and preserved in various wholesome palatable ways. From them as by-products are obtained oil, gelatin, and leather. Arrangements have been made with individuals and corporations for the canning, salting, and smoking of large lots of dogfish for food and for utilizing in other ways parts other than the flesh.

To obviate a deep-seated prejudice against the name of "dog-fish," which is not a distinctive name for any one fish but is applied

indiscriminately to various other fishes of our fresh and salt waters, the name "grayfish" has been adopted for trade purposes. This is quite in accord with the custom of the business in which the same fish is regularly sold under different names in different sections of the country. Before opening the public campaign to introduce this fish as food, it was served to several hundred persons at Cornell University at the meeting of the Home Economics Department of New York Agricultural College in 1916. In the month of August, 1916, it was served to about 2,000 persons in connection with the Eastport Fish Fair, at Eastport, Me. In both cases it was pronounced excellent. I have eaten it in different forms in my own home with satisfaction. A growing market for the fresh fish is being found in connection with the tile fishery. There is no reason whatever, save only prejudice, why this abundant nutritious fish food should not come into general use.

Continued success has been attained in propagating the diamond-back terrapin. The three oldest broods of terrapin hatched and reared in confinement have produced eggs which have hatched successfully. The adult breeding stock has increased in productivity from year to year, and it is believed the climax is not yet reached. The terrapin that were winter fed the first season laid eggs at the age of 5 years, while those that hibernated the first year did not lay eggs until 6 years old. The mortality among terrapin winter fed with fresh fish was $6\frac{1}{2}$ per cent, while among those that hibernated the death rate was 13 per cent. The cost of feeding terrapin during the first critical winter, when the largest losses occur in nature, is low, varying from 3 to 15 cents per thousand terrapin per day, depending on whether they are fed with fresh fish, salt fish, or oysters. If an average of 10 cents is assumed, the cost of feeding one terrapin for 5 months (the hibernating period) is but $1\frac{1}{2}$ cents. The death rate among impounded terrapin is remarkably low. As regards disease and mortality, the rearing of terrapin is more successful than that of poultry. About 3,000 terrapin in 25 experiment classes are now under observation, and the feasibility of terrapin culture is regarded as established.

The *Albatross* during the past fiscal year gave three months to surveying the halibut grounds off the coasts of Oregon and Washington, continuing the work of the previous year. A report on this work will soon be published. Other work has been done on the blackfish grounds off the North Carolina coast. The known limits of the banks have been extended, and continues

to maintain on the principal ground a conspicuous buoy, which is of great aid to the fishermen.

The tuna fishery has become of economic importance in southern California. The migrations of the tuna are, however, so erratic and the fishery therefore so uncertain that the canners suffer from enforced idleness much of the year. At the earnest request of the industry and by virtue of the appropriation in the urgent deficiency act, the *Albatross* has been engaged for several months in an exploration to determine the habitat of the fish after they have disappeared from the coast. This work is progressing.

A somewhat similar work is being done by the schooner *Grampus* in the Atlantic Ocean between Cape Henry and the Bay of Fundy, embracing the most important fishing grounds off the eastern coast of the United States. This investigation is broader in its scope, having for its object the determination of the conditions controlling the movements and abundance of migratory fishes in general, to the end that those due to human agencies and controllable may be differentiated from those having natural causes which can not be regulated, but possibly may be met by modifications of fishing methods.

Alaskan Fur Seals.

The Alaskan fur-seal herd continues to show recuperative capacity under the international arrangement that has been effective since December 15, 1911.

The census of the herd in 1915 indicated a total of 363,872. This number was in part estimated, because the enumeration of certain components of the herd is impossible, and in part was based on actual count. The newborn pups numbered 103,527, and the females of breeding age numbered the same. The total number of animals estimated to be in the herd was not entirely comparable with the number estimated for previous years because of the adoption of a somewhat different method of calculating the natural mortality. Heretofore the assigned natural death rate in the different classes of seals had been based on a purely arbitrary assumption; but in 1915, as the result of extensive branding experiments undertaken in 1912, it was possible to determine the percentage of survival among the branded seals that came back as 3-year-olds, and a more accurate mortality curve was thus obtainable. The indications are that in the former years the actual death rate among certain herd groups was overestimated.

The 1916 census, taken under the same conditions as in 1915, showed a gratifying increase over the previous year. The number of pups born was found by actual count to be 116,977, the number of breeding cows deducible therefrom was 116,977, the number of harems was 3,500, the number of full-grown bulls without harems was 2,632, the average size of the harems was 33 cows, and the estimated total strength of the herd was 417,329.

A conspicuous feature of the herd in 1916 disclosed by this census was the large number of males of breeding age and the still larger number of adolescent males that will be passing over to the breeding class. On the basis of the average harem in 1916, the number of idle bulls then on the rookeries was sufficient for the needs of a herd of 86,500 additional cows. This accumulation of surplus breeding males was a normal consequence of the operation of the existing law, which has prohibited the taking of any seals during the past four years beyond the limited needs of the natives of the Pribilof Islands for food.

The experimental branding of seals, in addition to furnishing more accurate information of natural mortality, has afforded invaluable data, hitherto lacking, showing in a definite and indisputable manner the relation between the age of seals and the size and weight of their skins. The long controversy that has been waged over the alleged killing by former lessees of the seal islands of seals of illegal age could never have been precipitated if the facts disclosed by the recent branding experiments could have been available. These experiments, and the authenticated skins resulting therefrom, unmistakably show a wide range in the size of seals of the same age and prove that the age of any given fur seal can not be infallibly determined from the size or weight of its pelt. This important point is clearly brought out in the following statement showing the London trade categories into which fall the skins of 100 fur seals branded as pups in 1912 and killed when 3-year-olds in 1915:

Small pups.....	7
Middling pups.....	42
Large pups.....	42
Smalls.....	8
Middlings and smalls.....	1
Total.....	100

The skins were handled in the regular course of operations at the dressing and dyeing plant in St. Louis in December, 1915, and were graded according to the London standards by a person who for

33 years had been engaged in the same business as the responsible agent of the principal sealskin dressing and dyeing establishment in London.

The Department has been approached with reference to instituting a suit against the former lessees of the Pribilof Islands for alleged violation of law and contract, according to testimony taken in 1911-1914 by the House Committee on Expenditures in the Department of Commerce. Acting under my instructions, the Solicitor of the Department examined the voluminous testimony and documents in the case for the special purpose of advising the Department whether the evidence therein disclosed warranted the making of a recommendation to the Attorney General that he enter a suit against the former lessees. After an investigation extending over many months the Solicitor reported that the facts did not justify such a course.

In the season of 1915 the quota of surplus male seals that could be taken for the use of the natives of the Pribilof Islands was fixed at 5,500. The number actually taken during the regular summer killing and during the fall and winter after the main body of the seals had withdrawn from the islands was 3,947. In the season of 1916 the number that could be taken was tentatively fixed at 5,000 3-year-olds, with the understanding that such additional seals up to 7,500 as might be required for and by the natives could be taken. The number utilized up to the close of the regular season was 5,392, and that number of skins was included in the shipment on the last vessel leaving the islands in the fall of 1916.

For reasons stated in my last report the fur-seal skins then on hand resulting from the food killings of the natives in 1914 and previously were not offered for sale, and the condition of the trade made it desirable to postpone beyond the limit of the fiscal year 1916 the marketing of those skins and of the additional ones obtained in 1915. Congress was appealed to for the necessary authority, and a joint resolution to this end became a law on June 22, 1916.

Meanwhile the Department has been able to bring about the establishment in the United States of a plant for the dressing and dyeing of sealskins according to the best known methods.

The United States is the largest producer of raw sealskins in the world. It is also the largest consumer of finished seal furs. This would seem to make it natural that it should sell its own sealskins and dress and dye its own furs. It never has, however. We have in the past sent our raw sealskins to London. We have paid

London for dressing and dyeing them, and we have bought them back, paying duty on them on their return and the incidental charges due to double transportation. This added 52 per cent to the price of the raw skins, so that the fur laid down in America, ready to be made up into garments, cost over one-half more than it did when it was purchased as a raw skin.

The Department of Commerce took the first step to end this two years ago, when the sale of the raw sealskins took place for the first time in this country. It was a success. Better prices were had than the foreign ones. The Government got more and it cost the Government less. Last year there was no sale because there was no market, and Congress authorized withholding the skins. On October 21, 1915, a second sale of Government fur skins, this time fox skins, was made in this country with even greater success. There were buyers from many foreign lands, and the prices were higher than ever before obtained. Meanwhile, the Department has been planning to establish the best known method of dyeing and dressing raw sealskins in this country in order that the whole process from beginning to end might be American. This it has now succeeded in doing.

Acting after the advice of the Attorney General, the Department has made a contract for a limited term for the sale of its production of sealskins at auction to all buyers who may come. A consideration of this contract is that the best process of dyeing and dressing seal furs known to the trade shall be promptly established in this country. This was done to prevent the deterioration of something like 8,000 skins which the Government has now in cold storage, but means the permanent establishment of the new industry in the United States. It is expected that it will return a greater profit to the Government on the sale of its skins, while at the same time so reducing the expenses incidental to the dyeing and dressing that the finished fur will be sold at a lower cost to the American consumer than heretofore.

On September 20, 1916, in the city of St. Louis, the first sale took place of the fully dressed, dyed, and finished sealskins ever disposed of by the Government. The lot comprised 1,900 skins. The prices obtained were such as more than covered the cost of dyeing, dressing, and finishing the skins, and the goods were generally approved by a critical class of buyers. The market value of sealskins as furs is suffering from the substantial withdrawal of the article from the market by reason of the closed season. If and when the sale of the furs on a commercial scale resumed,

it is the expectation of the trade that the prices obtained for them will be enhanced.

The sale mentioned, which was the first of its kind in the United States, is the culmination of an effort to establish a new American industry.

An American product, the property of the American people, largely utilized by American women, heretofore shipped across America to a foreign country for sale and for subsequent preparation, is now being sold in an American market and being dressed and dyed in an American city for both domestic and foreign consumption.

The patrol of the north Pacific Ocean and Bering Sea for the purpose of preventing pelagic sealing has been maintained by Coast Guard vessels and has been effective. The thanks of the Department are given the Coast Guard for the manner in which the patrolling vessels have performed an arduous duty and for various acts of courtesy and helpfulness in connection with the movements of persons, mails, and supplies to and from the seal islands.

The North Pacific Sealing Convention of July 7, 1911, and the act of Congress approved August 24, 1912, giving effect to that convention permit certain Indians, Aleuts, and other aborigines dwelling on the Pacific coast of North America, north of the thirtieth degree of latitude, to kill fur seals under restricted conditions. So far as the records of the Department show, no seals were thus taken in 1915, but several hundred, mostly females, were killed by Indians of the State of Washington in 1916, as in 1913 and 1914.

When the commercial killing of fur seals shall be renewed, other products than the skins must have consideration. The carcasses contain materials having economic value hitherto wasted and available not only as possible food but in other directions. The Fisheries Service is giving careful study to these matters.

Seal Island Natives and Their Support.

The native inhabitants of the Pribilof Islands, who are Government wards and depend for their existence on the supplies sent to them by the Department every season, are now generally regarded as forming one of the best fed, best clothed, best educated, and best conditioned native communities in Alaska. Their number remains fairly constant, and in 1915 totaled 314—193 on St. Paul Island and 121 on St. George Island. These people render such

labor as they can and are paid in supplies or cash. In former years, when commercial sealing was in progress, they received comparatively large sums for services performed in connection with the driving and killing of seals and the taking and curing of their skins, and many of them accumulated funds which were deposited to their credit in savings banks. In recent years there has been little opportunity for them to acquire or save money, and their bank accounts have diminished. At the present their savings, amounting to \$4,917.91 on June 30, 1916, are on deposit in Washington, D. C., in the names of the individual natives, with the Commissioner of Fisheries as trustee. These accounts were audited by the Disbursing Clerk of the Department in September and found correct.

The health of the natives has been good. Improved housing and sanitary conditions have resulted in the mitigation of tuberculosis, which was at one time prevalent. Additional improvements, for which Congress has in part provided, will further advance the physical condition of the natives and add to their comfort and contentment. The making and using of intoxicating liquors has been suppressed.

The education of the native children is proceeding well, with stress laid on manual training and on the use of the English language. The teaching staff is efficient and has the confidence of the natives.

Supply Vessel.

Because of the delay in finishing the work upon the steamer *Roosevelt*, a naval collier took the supplies to the Pribilof Islands in the fall of 1915, and in the summer of 1916 a private vessel was chartered for this purpose. The method of purchasing supplies outlined in my last report has been followed with advantage to the Government. The work of overhauling the *Roosevelt* has been delayed by a serious strike in the shipyard where the work was proceeding and by the time requisite for making improvements and changes recommended by the Superintendent of Naval Construction of the Lighthouse Service and the Bureau of Construction and Repair of the Navy. Further delay arose from the time requisite to secure a new tail shaft to replace one found to be bent. All the work is now nearly complete, and the vessel is expected to be ready for service by the time this report is printed. The following statement shows in detail the cost of purchase, of alterations, and of repairs to the steamer *Roosevelt* to September 20, 1916:

Purchase price..... \$35,000.00

ALTERATIONS.

Converting vessel from coal to oil burner and general overhauling.....	\$13,000.00	
Removing bulkheads and changing location of dynamo.....	\$460.00	
Extension of upper deck; moving pilot house, steering engine, and appurtenances; and altering galley.....	3,500.00	
Rearranging after quarters.....	490.00	
Installing bulkheads.....	485.00	
Changing coal-bunker deck.....	145.00	
Toilet furniture.....	62.40	
		5,142.40
Installing pipe connections, etc.....	125.00	
Changing feed-water heater.....	45.00	
Changing boiler-feed piping.....	225.00	
		395.00
Furnishing and installing drains to oil tanks.....	200.00	
Straps and steel cradles, etc., under oil tanks.....	700.00	
Making and installing heaters, etc.....	330.00	
		1,230.00
Increasing height of stack, etc.....	500.00	
Installing wireless outfit.....	475.00	
Searchlight, furnished and installed.....	345.00	
Davits for motor boat.....	400.00	
		1,720.00
Total for alterations.....		21,487.40

REPAIRS.

Renewing propeller and repairing shaft and rudder.....	2,700.00	
Tail and thrust shafts, etc.....	800.00	
Thrust bearings.....	145.00	
Tail shaft.....	1,700.00	
Repairing propeller.....	1,100.00	
		6,445.00
Adjusting rods of thrust bearing.....	35.00	
Renewing sash bar in engine room.....	20.00	
New stuffing box.....	185.37	
Overhauling main engine.....	1,410.00	
Overhauling valves, etc.....	295.00	
Examining and repairing pumps.....	370.00	
		2,315.37
Repairing smokestack.....	70.00	
Repairing boiler.....	275.00	
Bracket knees on stringers to brace boiler.....	218.30	
Retubing boiler.....	2,205.00	
		2,768.30
Renewing hatch coamings.....	125.00	
Renewing sheathing, recalking, and painting.....	1,573.00	
Chain plates and smokestack guys.....	350.00	
Improvements to fireroom ventilation.....	405.00	
		2,453.00
Bracket knees and steel straps, etc., on main deck.....	805.00	
Repairs, general.....	1,194.00	
Total for repairs.....		15,980.67
Total expenditures.....		72,468.07

The vessel as she stands after the above total outlay represents to the Government an investment of much less than her original cost and much less also than the sum at which it is believed it would be possible to sell her for cash.

Fox Herds.

The herds of blue foxes which inhabit the Pribilof Islands continue to flourish and to yield to the Government a revenue that assists materially in maintaining the natives. The trapping of the foxes is done in winter, under careful supervision, after a computation of the apparent number of foxes available and after making an adequate reserve for breeding purposes. The trapping is done by the natives, who are allowed supplies at the rate of \$5 for each fox taken and utilized. The skins obtained during the winter of 1914-15, numbering 253 blue foxes and 40 white foxes, were sold at public auction in St. Louis on October 21, 1915, together with the skins brought from the island in the previous season, whose sale had been deferred on account of the fur market. These numbered 256 blue foxes and 25 white foxes. The prices obtained were higher than had ever before been received in any market for blue-fox skins. Five lots, consisting of four skins each, brought \$1,092, \$1,020, \$1,012, \$1,000, and \$980, respectively, and the entire proceeds of the sale were over \$56,000.

The take of fox skins during the winter of 1915-16, numbering 420 blue foxes and 20 white foxes, were sold in St. Louis on September 20, 1916. The prices obtained were not as high as in the previous year. The gross receipts from the sale of fox skins aggregated \$20,527.

The Department is under deep obligations to the Navy Department for the continuous and efficient service rendered through the operation of the two radio stations on the seal islands. In former years the islands were completely isolated from the outside world during the long winter season, but now the Department maintains easy communication at all times.

Minor Fur-Bearing Animals of Alaska.

The Bureau of Fisheries is still charged with the duty of enforcing the law and regulations for the protection of all the fur-bearing animals in Alaska, terrestrial as well as aquatic. The field work is performed primarily by the seven wardens in the Alaska fishery patrol for whom provision is made by law. They are assigned to those districts having the most important output of fur-bearing animals, but their number is insufficient to cover the Territory

properly. Other members of the Alaska fishery service also render such assistance as they can.

The recommendations of the interdepartmental committee from the Departments of Agriculture and Commerce, contained on page 123 of my last report, are again approved and the attention of Congress is specially called to them. It is still uncertain whether a brown bear is a brown bear merely because he is a brown bear. The whole matter should be taken out of the hands of the Fisheries Service, which should have nothing to do with land animals, and should be placed in the care of the Agriculture Department. House bill 10393, now pending but not reported, would provide this result and would carry out fully the recommendations of the interdepartmental committee.

In October, 1915, Warden Reginald F. Irwin was lost while engaged in patrol work in southeast Alaska. He left Ketchikan October 9, 1915, on a hired launch, with two men. The boat was found wrecked several days later in the Chickamin River, but no trace of the men was found and no satisfactory explanation of the cause of their disappearance has ever been given. Careful but fruitless search was made.

The revised regulations for the protection of fur-bearing animals in Alaska, which were published in Department Circular No. 246, third edition, under date of May 24, 1915, have been found quite satisfactory. These regulations place no special restrictions upon the shipping of live fur-bearing animals from Alaska or upon the taking of live animals at any time for use for breeding purposes. It was with hesitation that the Department removed restrictions upon shipping live animals from the Territory. While it is felt that there should be restrictions of this kind, the law does not clearly authorize the Department to make the regulations. Owing apparently to the decreased outside demand for fur-bearing animals for use for breeding purposes, particularly foxes, but few were shipped from Alaska in the calendar year 1915. Records at hand indicate that 58 foxes, 34 minks, and 1 black bear were exported. This cessation of demand for live Alaska fur bearers may be temporary, and it is earnestly recommended that the Government be empowered to make proper regulations in regard to the exportation of these animals from the Territory. Bona fide fur farmers should be permitted to secure breeding animals from wild stock, and under proper regulation they should not be restricted to the open season in which to take them, at least until breeding stock may be obtained under reasonable conditions from other farms.

The lack of proper regulation of this matter results in abuses which meet with general disapproval throughout Alaska. It is hoped that Congress will provide legislation which will enable this matter to receive proper attention.

The rapid decline in the number of martens in Alaska made it apparent in the fall of 1915 that further restrictions should be placed upon the taking of these valuable animals. Early in 1916 the Department issued a regulation that on and after March 15, 1916, the killing of marten is prohibited until November 15, 1921. Few objections were made to the regulation, and approval was general among persons familiar with the conditions.

It is noted with regret that the protection which has been afforded the sea otter for some years has not resulted in any apparent increase of these valuable animals.

Following violations of the laws and regulations, a number of seizures of pelts and of prosecutions took place.

Fur farming continues to receive attention in Alaska. The business is confined almost wholly to breeding foxes, and in this work the several color phases of the red fox as well as the blue fox are used. The law does not authorize the Bureau of Fisheries to exercise jurisdiction over fur farming save so far as the killing of fur bearers is concerned. No fur-bearing animals may be killed in Alaska except under regulations prescribed by the Secretary of Commerce. Acting under this authority the Department has established a regulation that no fur-bearing animal captured in the season when its killing is unauthorized may be killed at any time whatsoever. This regulation is intended to prevent the indiscriminate taking of animals in the close season under the pretext of using them for breeding purposes but actually with the intention of holding them until the open season and then killing them.

Fox farming is carried on in the Kodiak-Afognak region, on islands westward of the Kodiak-Afognak group, in the Copper River district, along the Yukon and Tanana Rivers, and in southeastern Alaska.

It is regretted that many have gone into fox farming with inadequate knowledge, with no facilities for caring for their stock, and apparently with no serious intention to pursue the business to any end. Others have gone into the business seriously with sufficient capital. It is hoped that their efforts will be rewarded with success.

The Department requires all fur shipments from Alaska to be reported to the Bureau of Fisheries, and an arrangement with the

Post Office Department obliges all postmasters in Alaska to certify to the correctness of the reports made of shipments of furs by mail. Postmasters, agents of commercial companies, and individuals have shown a ready cooperation with the Department in the matter of collecting these statistics. In the year ended November 15, 1915, there were shipped from Alaska, exclusive of the Pribilof Islands, furs having an estimated value of \$400,532. The chief fur bearers represented by this amount are foxes, lynx, and mink.

No additional islands were leased in the fiscal year 1916 for the purpose of propagating foxes and other fur-bearing animals. The leases for Carlson, Middleton, Simeonof, and Little Koniugi Islands, which were executed in 1914, remain in effect. In the summer of 1916 the Department accepted a proposal for the leasing of Marmot Island, near Afognak Island, for a period of five years, at an annual rental of \$200.

Fisheries of Alaska.

As it was thought desirable to further limit fishing in the waters of Alaska, a hearing was held in Seattle on October 1, 1915, in order that persons interested in the fisheries of the waters involved might have an opportunity to present their views. The hearing confirmed the Department's opinion in the matter; and on October 25, 1915, an order was issued to be effective January 1, 1916, limiting fishing in the following-described waters: (1) All waters tributary to Barnes Lake, Prince of Wales Island; (2) Hetta Creek, its tributary waters, and the region within 500 yards of the mouth of said creek; (3) Sockeye Creek, its tributary Boca de Quadra hatchery waters, and the region within 500 yards of the mouth of said creek. ✓

For the enforcement of the fishery laws there has been maintained during the active fishing season as adequate a patrol as the funds and personnel of the Bureau would permit. In addition to the steamer *Osprey*, a number of privately owned boats were used in this work for various periods. There is an appropriation of \$10,000 for the fiscal year 1917 for the purchase or construction of two motor launches for the Alaska fishery patrol. These boats will be useful, but other and larger boats are urgently needed for an effective patrol of the various districts.

The census of the salmon entering Wood River (Lake Aleknagik) for spawning was again taken up in 1915 and 1916. The number of salmon entering the lake in 1916 was 551,959, as compared with 259,341 in the previous year.

In January, 1916, the Department authorized the Pacific-American Fisheries to construct and operate on Unalaska Island a plant for the canning or salting of salmon or other food fishes taken in the vicinity of the island. Careful provision was made to ensure when possible the employment in the operations of the company of Aleuts or Indians who were residents of the reservation. In January, 1916, a private individual of Unalaska was authorized to carry on certain limited fishery operations within the reservation, this permit being a continuation of one issued in December, 1914. In June, 1916, a permit was issued to the Union Fish Co., of San Francisco, to engage in cod-fishery operations on Tigalda Island. In both of these latter cases due provision is made for the employment of natives of the reservation.

Five privately owned salmon hatcheries were operated in Alaska in the fiscal year 1916. In the fiscal year ended June 30, 1915, the number of red-salmon fry liberated from these hatcheries was 79,619,500. The corresponding output from these hatcheries for the year ended June 30, 1916, omitting that from the hatchery on the Naha stream in southeast Alaska operated by the Alaska Packers Association, for which returns are not yet available, was 42,658,000. The output from the Naha stream hatchery in the fiscal year ended June 30, 1915, was 20,820,000.

In the fiscal year 1915 the output of the private hatcheries afforded rebates of taxes amounting to approximately \$31,800, under a provision of law which allows for every 1,000 red or king salmon fry released a rebate of 40 cents on the license fees or taxes on canned salmon packed. On June 30, 1916, the hatchery operated by the Alaska Packers Association on the Karluk River was permanently closed.

The total investment in the Alaskan fisheries in the calendar year 1915 was \$37,316,560, an increase of \$277,928 over the preceding year. Approximately 86 per cent of this investment was in the salmon industry. The number of persons employed was 22,462, as against 21,200 in 1914. The total value of the products was \$20,999,343, a decrease of \$243,632 from the preceding year. The actual quantity of fishery products in 1915 was greater than in 1914, but a lower price was obtained for several grades of salmon packed and there was a decrease in the pack of the more valuable red salmon. There was a large increase in the pack of humpback salmon in southeast Alaska and of pink salmon in west Alaska. In the commercial fishery there were taken 63,537,244 salmon of all species, as against 54,615,915 in 1914, an increase of

8,921,329. There were operated 85 salmon canneries, as compared with 81 canneries in 1914. The pack of canned salmon was the largest in the history of Alaska, amounting to 4,500,293 cases, valued at \$18,653,015, compared with a pack of 4,056,653 cases, valued at \$18,920,589, in 1914.

The halibut fishery, which is second only to the salmon fishery in importance, is being adversely affected by the action of the Grand Trunk Pacific Railroad in connection with its terminus at Prince Rupert. The matter is now the subject of international negotiations. This Department has brought the facts strongly before the attention of the State Department in the confident expectation that when the injury being wrought to American interests in Alaska is made clear due action will be taken to correct the difficulty.

A comprehensive revision of the fishery laws of Alaska has been under consideration by the Committee on the Merchant Marine and Fisheries of the House of Representatives, and numerous hearings have been held on the bill (H. R. 9528) introduced by Chairman Alexander on January 20, 1916. On August 18, 1916, a revised bill (H. R. 17499) was introduced accompanied by a favorable report. This important measure should be speedily enacted into law.

Propagation and Distribution of Food Fishes.

We record another highly successful year in the propagation and distribution of food fishes. The aggregate output exceeded that of any previous year by more than 558,500,000. The general increase represents more intensive work in old fields and the extension of the work into new fields. What is regarded as a more satisfactory outcome of the year's work than the increased production is the conspicuous gain in the number of fish reared to the large fingerling sizes before planting, the increase being nearly 50 per cent over 1915.

The average cost per million of fish produced and planted in 1916 was \$117.86, compared with \$131.55 in 1915, \$146.36 in 1910, and \$239 in 1905.

The hatchery output may be conveniently classified and summarized as follows:

Marine species of the Atlantic coast.....	3, 112, 299, 525
Migratory fishes of the Atlantic coast.....	442, 472, 788
Fishes of the Great Lakes.....	947, 870, 217
Migratory fishes of the Pacific coast.....	248, 975, 220
Fishes of the interior waters.....	95, 644, 816
Total.....	4, 847, 262, 566

The artificial propagation of cod, pollock, and winter flounder was conducted on a large scale at the three New England hatcheries. Especially noteworthy was the extent of the work addressed to the winter flounder, an excellent food species, which now supports a large fishery. The hatching of the lobster, which is practically confined to the station in Maine, was less successful than in 1915 owing to weather conditions which affected the eggs carried on the lobsters impounded through the winter. The precarious state of the lobster fishery is evidenced by the inability of the two hatcheries in Massachusetts to obtain eggs except at a prohibitive cost, by the increasing difficulties encountered in making collections of brood lobsters, and by the increasing tendency in some places to violate the laws of nature and man.

The most successful shad-hatching operations on the eastern seaboard were on the Potomac River, where, in contrast with the experience of recent years, there was a good run of fish, which permitted a fairly large take of eggs. The outcome was attributable in part to the action of the War Department in maintaining in Chesapeake Bay and tributaries open passageways for navigation, of which the fish could take advantage, and in part to large plants of young shad in 1912, which were due to return as mature fish in 1916. At the shad hatchery at the mouth of the Susquehanna River there was a practical failure, such as has characterized all recent years, owing to conditions over which the Fisheries Service has no control. The closure of the hatchery until such time as these conditions are removed is clearly demanded. A very unfavorable shad season in the North Carolina sounds and streams, owing in part to meteorological conditions and in part to rivalry among fishermen using different kinds of gear, greatly reduced the operations of the Albemarle hatchery, the output being one of the smallest in recent years. At the request of the State authorities and members of the North Carolina delegation in Congress, the steamer *Fish Hawk* was sent to the Cape Fear River to serve as a floating shad hatchery, and a portable hatchery was established also in connection therewith on a tributary of that stream. The results of this experimental work were largely negative, owing to the scarcity of ripe fish. As an adjunct of the Orangeburg (S. C.) station, two field shad hatcheries were located on the Edisto River, largely with a view to determining the possibilities for shad culture in that region. At the height of the very short spawning season the work was suddenly brought to a close by the State fish warden because of his doubt of the legality of the methods

employed by the fishermen on whose catch the hatcheries depended for their eggs. There were the usual successful operations with the Atlantic salmon on the Penobscot River, the white and yellow perch in the Chesapeake Basin, and the striped bass on the Roanoke River.

A third large plant of humpback salmon, hatched in Maine from eggs sent from Puget Sound, was made in the fall of 1915, and a fourth deposit, aggregating 229,584 fingerling fish, was made in 1916. The indications for the permanent establishment of this excellent fish in certain New England waters are promising.

In the Great Lakes, the collections of lake-trout and whitefish eggs, while aggregating upward of 547 millions, were less than last season, owing to boisterous weather during spawning time. An abnormally cold and late spring likewise resulted in a shortage in the pike-perch operations, although the output of fry reached the very considerable total of 436,696,740.

The year's work in the artificial propagation of the Pacific salmon eclipsed all records. About 250 million fish, representing five species, were hatched and planted under favorable conditions, the bulk of the output being chinooks and sockeyes. In pursuance of the fixed policy, increased facilities for rearing salmon are provided each year; and in 1916 nearly 55 million salmon were held at the hatcheries until they reached the fingerling size, an increase of about 100 per cent over the previous year. Successful operations were carried on at the Yes Bay (Alaska) hatchery with the sockeye salmon and on the Columbia River with the chinook salmon, the work in the latter field being of greater magnitude than ever before.

At hatcheries in the interior, where the trouts and basses are handled, good work has been done. The output of the pond fishes was somewhat decreased, but fishes of larger size have been delivered to applicants and the general results have been more satisfactory than before. Increased attention is given by farmers to stocking ponds with desirable food and game fishes. Several very influential monthly home magazines have been urging the importance of private fish ponds, and the Bureau has distributed many thousand copies of *Fish Ponds on Farms*, a document prepared for the special purpose of giving practical instruction in making and maintaining fish ponds. Applicants in all parts of the country have been supplied with suitable fish for this purpose.

The hatchery output reached public and private waters in every State, as shown by the details of distribution published in the annual report of the Commissioner of Fisheries. The Bureau's railway fish cars were in commission throughout the year and were hauled 149,781 miles while carrying their loads of living freight. Detached messengers, supplying fish to waters off the main lines of travel, covered 645,721 miles. About 10½ per cent of the travel of the cars and 19 per cent of the travel of messengers were furnished gratis by railroads, the remainder being paid for at varying rates. The new steel fish-transportation car, referred to in my last report, was completed and placed in service. Two additional steel cars have been authorized by Congress, but the increase in the cost of materials and labor makes it impossible to secure fully equipped cars within the appropriation. Bids will be obtained and an appeal will be made to Congress for the additional sum necessary.

Stress must be laid on the important rescue work conducted in the Mississippi Valley by special seining crews who operate from Wisconsin and Minnesota to Mississippi and Arkansas. The season's collections were larger than for many years, and food fishes of great value were saved. The total number of fish rescued was upward of 11,682,000 adults, yearlings, and fingerlings, of which about 1,180,000 were delivered by cars and messengers to applicants, while the remainder were returned to the main streams. A conspicuous public service was rendered in March and April, 1916, when about 5 million adult and large fingerling fish were rescued from an area of 11,000 acres along the Illinois River. This region had been inundated when the fishes were in a spawning condition, and as the waters subsided the young and their parents became stranded and were found in great numbers in drainage ditches and depressions when the rescuing parties arrived. This field is very large and can be only partly covered with the present facilities. The work deserves special recognition and support from Congress.

The Bureau aims to maintain close relations with the State fishery authorities and to conduct its work in cooperation with them. The Bureau makes large consignments of fish eggs to States having hatcheries, and also turns over to the States considerable quantities of fry and fingerlings to be planted under local auspices. In 1916 about 377 million eggs and 11 million young fish were thus supplied to 28 States.

The station at Saratoga, Wyo., was opened during the year. The new station in Utah is in course of construction at Springville, the site having been acquired after considerable unavoidable delay about the title. Block Island has been chosen as the site of the new Rhode Island hatchery, but the necessary land has not yet been secured. It is a pleasure to note that the hatcheries at Louisville, Ky., and Orangeburg, S. C., give promise of great usefulness. The output of large-mouth black bass at Orangeburg during the first season of operation was unusually large.

Field stations recently established under the general authority possessed by the Department have been successfully operated on the Quinault Indian Reservation, in Washington, and on the Klamath River, in California, for chinook and silver salmons. These are demonstrated to be such important sources of eggs that the establishment of regular hatcheries thereat is warranted.

The extraordinary interest manifested by the public in the extension of governmental fish-cultural work has been shown by the demand for additional hatcheries in all parts of the country and by the introduction of numerous fish-hatchery bills in both Houses of Congress. In May, 1916, the Committee on the Merchant Marine and Fisheries of the House of Representatives made a favorable report on a bill (H. R. 15617) providing for 17 new fish hatcheries and a fishery experiment station. The amount carried by the bill is \$890,000.

Congress has passed a joint resolution authorizing the Secretary of Commerce to accept from Mary A. Scully the gift of a trout hatchery in the Berkshire Hills, Mass. The property comprises about 135 acres, with buildings, ponds, and other accessories of a modern hatchery, and has an unusually abundant supply of water from three different sources. The hatchery was operated for a number of years by the late John S. Scully, and Mrs. Scully's noteworthy gift was prompted by a desire to have the property maintained perpetually for the purpose to which her husband had dedicated it. The property has passed into the control of the Bureau of Fisheries, and an item covering the necessary personnel has been included in the 1918 estimates submitted to Congress.

Fresh-Water Mussel Propagation.

The practical work of mussel propagation on a commercial scale is proceeding satisfactorily in connection with the Fairport (Iowa) Biological Station. Field parties operating in the Mississippi River, in the Wabash River, and in the Black and Whit-

Rivers, in Arkansas, during the fiscal year 1916 planted upward of 331,450,000 young mussels, representing seven species used in making pearl buttons. In the inoculating operations 424,550 fish were handled, over 300,000 of these being rescued from landlocked ponds in the overflowed lands and subsequently returned to the open waters. The average cost of providing, inoculating, and planting the young mussels was \$0.0155 per thousand for actual production. When allowance is made for overhead charges, the average cost was \$0.0235 per thousand.

The shells of mussels grown from the glochidia stage in the ponds at the Fairport Station have been made into buttons, and the practical application of this work has thus been demonstrated.

Commercial Fisheries.

While the Department outside of Alaska has no direct jurisdiction over these fisheries, it nevertheless is charged with the duty of conducting statistical and other investigations thereof, and through the Bureau's agents and correspondents it keeps informed regarding the general condition of all branches of the industry. It cooperates with the States in collecting data to guide legislation or regulation, it brings to the attention of the State authorities various fishery matters that demand legislative consideration, and it supplies to individuals and firms technical information and disinterested advice about commercial fishery enterprises.

During the past year the Bureau has conducted canvasses of the general fisheries of the upper Mississippi River; the crab industry of Chesapeake Bay; the coastal fisheries of New York and New Jersey, exclusive of shellfish; and the shad fishery of the Hudson River. In addition to the foregoing, the investigations of the fresh-water mussel fishery and pearl-button industry of the Mississippi River and tributaries and of the shad and alewife fisheries of Chesapeake Bay and tributaries, which had been in progress during the preceding year, were completed.

The completion of the extensive canvass of the fresh-water mussel industry has enabled the Bureau, for the first time, to determine its magnitude, the relative productivity of different streams, and the relative importance of the various species of mussels in the different districts. The results of the canvass were promptly made public through three statistical bulletins, from which it appears that more than 10,300 men and women were engaged in gathering mussels for the button factories or in search of pearls, that they had \$540,608 invested in boats and apparatus,

and that 51,571 tons of mussel shells, valued at \$825,776, and pearls and slugs worth \$376,284, were taken in one season.

One of the most important natural resources of Chesapeake Bay is the blue crab. Nowhere else is this species so abundant and so important as a source of income to fishermen and of food to local and distant people. The long continuance and increasing magnitude of the fishery have raised doubts as to the perpetuation of the supply, and the necessity for legislative restrictions has been discussed in the legislatures of both Maryland and Virginia, following a recent sharp reduction in the catch. In order to afford the States full and accurate data on which to base action, the Bureau placed its agents in the field on November 15, 1915, and on December 21, 1915, was able to present a bulletin giving detailed statistics of the industry for the calendar year 1915. This bulletin was distributed to State legislators, fishery officials, crab fishermen, packers, and others, and attracted much favorable comment. The two chief centers of the industry are Crisfield, Md., and Hampton, Va., but every county in both States having a frontage on salt or brackish water has its share in the fishery. The canvass showed that 10,290 persons were engaged, \$852,777 were invested, and over 151,000,000 crabs, weighing 50,343,268 pounds, were taken, yielding the fishermen \$981,807. The product in 1915 was the largest for which statistics are available, and the value of the catch was 50 per cent more than in 1908, the last previous year for which complete returns had been gathered. It is known, however, that the 1915 returns fell conspicuously short of those a few years before, and it is evident that the climax of this fishery came about 1912.

The Department has repeatedly brought to the attention of the public and the officials and legislatures of the States of Maryland and Virginia the waning shad supply, and has urged the necessity of laws that will give the shad a reasonable amount of protection while the schools are on their way to the spawning grounds. In order to secure further data to substantiate the contention that the shad is being neglected and demands serious consideration if its commercial extinction is to be averted, the Bureau made a complete canvass of the fishery in the Chesapeake Bay region in 1915, and published the results in a statistical bulletin, which was sent to the governors and legislators of Maryland and Virginia, accompanied by a series of three special charts showing the actual location of pound nets and gill nets set for shad on certain sections of the Virginia shore. This presentation apparently influ-

enced the Virginia Legislature in the passage of an act, effective in 1917, which is designed to afford a portion of the shad run a better opportunity to reach the spawning grounds.

As the fishery for alewives or river herring is intimately associated with that for shad, the same apparatus being employed and the fishes being caught at the same season, the canvass included the alewife as well as the shad fisheries, and the published bulletin gives the statistical returns for both. It is shown that this industry in 1915 gave employment to 8,839 persons and \$1,528,824 in invested capital and yielded products worth \$1,155,670 to the fishermen. Practically all of this is to be credited to Maryland and Virginia, for the interests of Pennsylvania and Delaware in the fisheries of the Chesapeake Basin are insignificant. Compared with 1909, the latest previous year for which complete statistics were collected, the shad catch of Maryland declined more than 50 per cent and the alewife catch nearly 47 per cent. In the Susquehanna River the yield of each of these fishes decreased about 88 per cent. In Virginia in the same period the catch of shad decreased nearly 22 per cent and of alewives over 29 per cent, notwithstanding the use of more apparatus. The pound net is the dominant appliance in both Maryland and Virginia, but fewer of these nets were operated than in 1909, while the use of gill nets has decreased in Maryland and greatly increased in Virginia. Compared with 1896, the pound nets have increased about 50 per cent in number and decreased 50 per cent in the quantity of shad taken; in other words, the amount of netting and labor required to take a given number of shad in 1915 was four times the amount in 1896.

There is not the slightest doubt that the waters of Maryland and Virginia are greatly overfished, and if this condition is allowed to continue the only conclusion to be drawn is that the people of these States and their representatives in the legislatures are willing that these important food supplies and sources of wealth shall be dissipated and lost.

In view of recent discussion of the net fisheries of the coastal waters of New York and New Jersey, the Bureau, at the request of the State authorities, in the spring of 1916 made a canvass of the commercial salt-water fisheries of these two States, exclusive of shellfish, for the calendar year 1915, and of the shad fishery of the Hudson for 1915 and 1916. The results of the canvass have been incorporated in a detailed bulletin, which has been generally distributed in the fishing districts. The data thus obtained will

be used as a guide by the States in determining if additional restrictive measures are required in order to protect the food fishes.

The coastal fishery of New York in 1915 gave employment to 2,504 persons, having invested capital of \$1,771,166. The chief items of investment were 166 vessels, valued at \$1,326,202. The principal apparatus of capture was 464 pound nets, 160 seines, 653 gill nets, and 5,373 fykes, together with numerous hand lines. Upward of 34,000,000 pounds of fish were taken, and for these the fishermen received \$1,121,641. The leading fishes were bluefish, butterfish, cod, flounders, menhaden, scup, sea bass, and squeteague, the first named being most important, with over 6,107,113 pounds, valued at \$492,928.

In the corresponding fisheries of New Jersey, 2,303 persons were employed and the investment was \$1,192,057. The vessels numbered 53, valued at \$232,855, and there were 174 pound nets, 132 seines, 1,761 gill nets, 970 fykes, and 90 bag nets. The catch, amounting to more than 47,856,000 pounds, had a value of \$1,348,667. The principal fishes taken were squeteague, ranking first, with over 14,121,000 pounds, valued at \$359,977, followed by sea bass, bluefish, butterfish, scup, flounders, croaker, menhaden, whiting, and cod, in the order given.

The Hudson was formerly one of our leading shad streams, and the yearly catch used to run into the hundreds of thousands. The fishery for years has been dwindling and has now reached a condition that can best be described as pitiable. The total number of shad caught on the New York and New Jersey shores was 15,855 in 1915 and 9,287 in 1916.

The fishery service maintained at the two ports of Boston and Gloucester has given detailed information regarding the extensive vessel fisheries centering there. This fleet in 1915 included 410 sail, which brought in 7,244 cargoes of fish, aggregating 171,595,000 pounds, valued at \$4,738,000. Compared with the previous year, there was a decrease of 354 trips or fares but an increased production of 9,000,000 pounds and an increased value of \$343,000. There was a slightly reduced yield of cod, but an increased catch of practically every other major species. Especially noteworthy was the increase in halibut, swordfish, and mackerel, the last named showing an advance over 1914 of 63 per cent in quantity and 73 per cent in value.

The halibut banks off the coasts of Washington and Oregon, recently surveyed by the *Albatross*, have been resorted to by numerous vessels, and comparatively large catches have been

made during the spring months. These grounds, however, are not generally visited after June, as the fish become scarce. The principal grounds are from Cape Flattery, Wash., to Portlock Bank, off Alaska. In the calendar year 1915, 100 American vessels were engaged in the fishery on all grounds. Their catch was about 50,240,000 pounds, of which about 33,135,000 pounds were landed in Seattle, 5,782,000 pounds in Alaska, and 11,323,000 pounds in Canada.

Marine Fishery Investigations.

At the last session of Congress provision was made for the creation of a number of additional positions in the scientific staff of the Bureau, particularly for the purpose of permitting the prosecution of more systematic investigations of the shellfish and shellfish industries than have heretofore been possible. Meanwhile, during the past fiscal year, important economic investigations of the oyster, the hard-shell clam, and the blue crab have been undertaken, and it is possible to report progress in various lines of inquiry.

The study of the "green gill" in oysters, a condition which renders them unsalable or impairs their sale value and often deprives the oyster crop of a large district of a market, has been of unusual interest and value. The condition in our waters has been found to be due to the same cause as in France, namely, a particular species of diatom, one of a large number of minute one-celled plants on which oysters feed. The desire of oyster growers is that the Bureau shall find a means of preventing "green gill"; but this condition in the Marennes district of France is welcomed by the oystermen, inasmuch as the oysters so affected are highly esteemed because of their color and of the flavor that accompanies the color. It therefore would seem desirable not to devote further time and money to the devising of means to prevent the occurrence of "green gill," but rather to make it known to consumers that their prejudice is foolish and that "green-gill" oysters are in the highest state of perfection.

Specific measures for the protection of the blue crab must rest on a sound biological basis. The Bureau is engaged in an intimate study of the life history and habits of this valuable crustacean, in order to be able to give sound advice to the States. Inasmuch as the crab is migratory, going from the ocean to the bays and back again, and sometimes passing different stages of its life cycle in different States, the Federal Government is the logical

agency for conducting the necessary investigations in an effective manner.

Fresh-Water Fishery Investigations.

There is a growing appreciation on the part of the public of the necessity for the careful conservation of the fresh-water fishery resources. This is reflected in the increased demand for fish for stocking streams and lakes, a more earnest striving for rational regulation of the fisheries, and greater insistence that sewage and industrial wastes shall be disposed of otherwise than by discharge into such waters. The fundamental requisite for a proper policy in respect to each of these is accurate information concerning the fishes, their environments, and the means employed in their capture, all of which have been receiving attention at the hands of the Bureau.

The food of fishes, which in any particular body of water varies greatly in character, both seasonally and with the species, age, and size of the fish, has been under investigation at several places in the Mississippi Valley. Special attention has been given at Fairport and Keokuk, Iowa, to the study of fish food in inclosed or impounded waters, and experiments have been conducted to determine how it may be multiplied in connection with the culture and rearing of food fishes in farm ponds.

At Keokuk, Iowa, the completion of a great dam as a part of a hydroelectric power plant has afforded an unusual opportunity for the study of the effects of such obstructions on fish life. This opportunity has been so used that it is expected within another year to present a report, with not merely local application but of general value in showing the effects of such structures and the means of dealing with them. An activity of still another kind is the study of fishes in relation to the public health. It is a matter of general knowledge that certain species of fishes are destructive of the larvæ of mosquitoes, but it is not so well known that not all of these fish are equally efficacious in waters of any particular type. The fish must be of a kind adapted to the conditions or else the characters of the waters under treatment must be modified to suit the kind of fish which may be available. In still other cases it may be necessary to introduce several species of fishes to meet the several conditions obtaining in different parts of one pond. During the year all phases of the subject were under investigation in cooperation with the Bureau of Entomology of the Department of Agriculture.

The United States has no jurisdiction over the pollution of waters as affecting the fisheries, but in pursuance of the policy of aiding in conserving the fisheries wherever possible a practical service has been rendered by investigating the reported pollution of important streams. A number of such cases have been studied during the year and the reports have been of value in showing the actual conditions. In some cases abuses are found and the necessity of correcting them is shown. In other instances the allegations are determined to be unfounded and a statement to that effect allays dissatisfaction. In either case the general subject is kept before the public and its importance is becoming more generally appreciated, as is evidenced, in part, by the increasing demands on the Bureau for work of this nature.

Operations at Fisheries Laboratories.

The laboratory at Woods Hole, Mass., which has no permanent scientific staff, was opened immediately before the beginning of the fiscal year and continued in operation until about the middle of September, the work being conducted through the agency of temporary employees recruited from universities and other scientific institutions. Studies of nutrition, greening, and propagation of oysters were continued with satisfactory progress. Other researches and experiments related to parasites and the effects of parasitism of fishes; the metabolism and oxygen utilization of fishes; the effects of mineral salts which constitute either normal constituents or pollutions of spring waters; and similar phenomena affecting fish culture and the utilization of fishes.

At the Beaufort (N. C.) laboratory there was the same season of maximum activity in addition to the work carried on by the too small permanent staff throughout the year. The results in terrapin culture and the survey of the fishing grounds carried on under the auspices of this station have been alluded to elsewhere. In addition, investigations and experiments were conducted with the quahog or hard clam and some of the principal crustaceans of the region, and, in cooperation with the Bureau of Forestry, to discover means of preventing or controlling the inroads of shipworms and other marine borers on submerged woodwork. What this station has accomplished and the opportunities for further work which it affords promise important economic service to the entire region served by it.

The laboratory at Fairport, Iowa, and the field parties operating in connection with it planted 331,451,490 larval pearl mussels during the year, the exceptionally high and prolonged flood stages

of the rivers making it impossible to quite attain the record of the previous year. Experience in the work and improvements in the methods made it possible to further reduce the cost of planting from 2.7 cents per thousand mussels in 1915 to 2.35 cents per thousand in 1916. Experiments in rearing have shown that after two seasons' growth the shells were of sufficient size to be usable for the making of buttons, although economy requires that they should be several years older before being taken for commercial purposes.

The laboratory has also been active in experimenting with the hatching and rearing of buffalofish and channel catfish, two important food species of the Mississippi Valley. The results with the former have been very encouraging, while near the close of the year the laboratory reported the first successful propagation of the channel catfish which has been attained anywhere. It is hoped that when the proper methods have been perfected both species will be available for stocking farm ponds in a large part of the almost fishless central part of the country.

This laboratory, which now has a fairly adequate permanent personnel, is rendering valuable service to a large part of the Mississippi Valley.

Vessels.

The steamer *Osprey* is in such bad condition that she has been ordered to Seattle for final examination to determine whether she shall be condemned or sold.

The steamer *Fish Hawk* is in urgent need of extensive repairs, which will be undertaken so soon as funds are provided.

The other vessels of the Service have continued their regular work throughout the year.

New Building.

The old building which houses the Fisheries Service is wholly unfit for its purpose. I earnestly hope that steps may be promptly taken to provide better quarters in the proposed new Commerce Building for its clerical staff, and that its scientific force may have the laboratories in the proposed new aquarium building which they so greatly need. If regard is given to the wonderful work of the Bureau of Fisheries in maintaining and developing an important part of the Nation's food supply, it will be clear that it ought to be provided with the best of facilities for so vital a work. It is now seriously handicapped in this respect, and in so far as its work suffers on that account the food supply of the Nation is injuriously affected. I ask that this receive the prompt and thoughtful attention it merits.

BUREAU OF LIGHTHOUSES.

The present organization of the Service under the act of June 17, 1910, is as follows:

Organization of Service.

The executive center of the Service is in Washington under the Commissioner and the Deputy Commissioner of Lighthouses. There are in this office an engineering construction division, under the chief constructing engineer; a naval construction division, under the superintendent of naval construction; a hydrographic division, under an assistant engineer; and the general office force, under the chief clerk. The Service outside of Washington is divided into 19 lighthouse districts, each under the charge of a lighthouse inspector. In each district there is a central office and one or more lighthouse depots. Each district is provided with lighthouse tenders for distributing supplies to the various stations and light vessels, for transportation of materials for construction or repair, and for care of buoys. In addition, there is in the third lighthouse district, at Tompkinsville, on Staten Island, in New York Harbor, a general lighthouse depot, where supplies are purchased in quantities, special apparatus is designed, manufactured, and repaired, ships are repaired and refitted, and various experimental work is conducted.

On June 30, 1916, there were 5,791 authorized positions in the Lighthouse Service. Of these, 123 were in the technical force, 147 in the clerical and office force, and 5,521 connected with depots, lighthouses, and vessels. Compared with the previous year this is a decrease of 1 in the total force.

Aids to Navigation.

During the fiscal year ended June 30, 1916, there was a net increase of 412 in the total number of aids to navigation maintained by the Lighthouse Service, including 45 lights above the order of minor lights, 5 fog signals, 2 submarine bells, 67 daymarks, 33 lighted buoys, 169 unlighted buoys, and 91 minor lights (including 8 float lights).

Fixed lights were changed to flashing or occulting at 46 stations. The illuminant of 19 lights was changed to incandescent oil vapor, the illuminant of 44 lights (including 2 light vessels) was changed

to acetylene, and the illuminant of 13 lights was changed to electric incandescent. On June 30, 1916, there were maintained by the Lighthouse Service 14,984 aids to navigation, including 5,323 lights of all classes and 584 fog signals (not including whistle and bell buoys), of which 52 are submarine signals. When the Lighthouse Service was established in its present form on June 30, 1910, there were 11,713 aids to navigation. The record therefore shows an increase in the six years of 3,271 aids, an average annual increase of 545 aids.

Following are some of the more important aids established or materially improved in the past fiscal year:

New fourth-order light stations, each with a fog bell, at Rondout North Dike, Hudson River, N. Y., and Point au Fer Reef, Atchafalaya Entrance, La.

Light vessel at Stone Horse Shoal, Nantucket Sound, Mass., in place of the vessel formerly stationed at Shovelful Shoal, in the same locality.

Improved system of lighted aids in the channels leading to Baltimore, Md.

Fog signals at Windmill Point, Mass. (electric bell); Rondout, N. Y. (bell); Point au Fer, La. (bell); Cleveland East Entrance, Ohio (electric siren); Ashland Breakwater, Wis. (electric siren); and Point Hudson, Wash. (reed horn). The former steam whistle at Cape Ann, Thachers Island, Mass., was changed to a compressed-air diaphone.

A submarine bell on Hedge Fence Light Vessel No. 9, Nantucket Sound, Mass.

Important lighted buoys in Cape Cod Canal Channel, Mass. (4 buoys, 1 with bell); Negro Ledge, Buzzards Bay, Mass. (bell); No Mans Land, Mass. (whistle); Plum Point, Long Island Sound, N. Y.; Shrewsbury Rocks, N. J. (bell); Cape Fear River Entrance, N. C. (whistle); Mullet Key, Fla. (bell); Santa Elena Shoal, Gallardo Shoal (whistle), and Tourmaline Reef, P. R.; Fighting Island Channel, Detroit River, Mich. (3 buoys); Eagle River Shoals, Lake Superior, Mich. (bell); Clatsop Spit, Oreg.; South Jetty, Oreg. (whistle); Blonde Reef, Hawaii (bell), and Lahaina, Hawaii.

Systems of minor aids and buoyage were extensively rearranged or improved in the following localities: Plymouth Harbor, Mass.; Cape Cod Canal Approaches, Mass.; Pawcatuck River, R. I.; Baltimore Harbor, Md.; Croatan Sound, N. C.; St. Catherine Sound, Ga.; Nassau Sound, Fla.; Lake Okechobee and connecting

waters, Fla.; Manatee River, Fla.; Inside Route, Fla. and Tex.; Middle Neebish Channel, St. Marys River, Mich.; Oakland Harbor, Cal.; and Pearl Harbor, Oahu, Hawaii.

Flashing acetylene lights at Pumpkin Island Reef, Me.; Padanaram Breakwater, Mass.; Canal Channel, Mass. (2 lights); Cuttyhunk North Jetty, Mass.; West Breakwater, R. I.; Mattituck Breakwater, N. Y.; Mud Island Range, Pa. (2 lights); Raccoon Creek Range, N. J. (2 lights); Oyster Creek, N. C.; Fort Sumter Range Front, S. C.; Coon Key, Fla.; Manatee River, Fla. (3 lights); Linda Island, N. Y.; Ballast Island, Ohio; St. Clair Flats Canal Range, Mich. (2 lights); Manistee South Breakwater, Mich.; Sheboygan South Pierhead, Wis.; Lewis Reef, Narrow Point, Middle Point, Point Alexander, Marmion Island, Sheep Creek, Clear Point, Barlow Islands, Naked Island, Little Island, Low Point, Kingsmill Point, Point Augusta, Hawk Inlet Entrance, Hawk Inlet East Shoal, Otstoia Island, McClellan Rock, Grey Cliff, Anchor Point, East Foreland, East Chugach, Flat Island, Race Point, and Point Romanoff, Alaska; Iceberg Point, Wash.; and Waterman Point, Wash.

The fiscal year was marked by three severe tropical hurricanes on the Gulf coast, all occurring within a period of approximately six weeks. The first of these storms was on August 16-17, 1915, in the vicinity of Galveston, Tex.; the second on September 3-4, 1915, near Apalachicola, Fla.; and the third on September 28-29, 1915, near New Orleans, La. No lives of persons in the Lighthouse Service were lost during these storms, but the damage to lighthouse property was great and widespread. A large number of stations and vessels in the eighth lighthouse district were damaged, and many small lights and other structures were destroyed. The total damage amounted to about \$212,000. A special appropriation of \$200,000 was made by Congress by the act of February 28, 1916, toward repairing and rebuilding the aids to navigation affected by these storms. Immediately after the close of the fiscal year, on July 5-6, 1916, another severe storm visited the Gulf coast in the general vicinity of Mobile, Ala., damaging lighthouse property to the extent of approximately \$140,000.

To assist in getting prompt information of defects in aids, a post card has been devised for the use of mariners, printed in such form that it is only necessary to insert the name of the aid reported, with date, time, and by whom observed, and mail it to the proper lighthouse inspector.

Arrangements were made to continue a number of buoys on station throughout the year instead of removing them in winter, as heretofore, because of ice conditions. This plan has been very satisfactory to mariners using the waters affected.

On account of the unprecedented movement of shipping on the Great Lakes, arrangements were made to continue aids to navigation as late as possible, consistent with the safety of employees and property of the Service.

Alaska.

The total number of aids to navigation in Alaska, including lights, fog signals, buoys, and daymarks, in commission at the close of the fiscal year ended June 30, 1916, was 388, including 147 lights, representing an increase of 110 lights since June 30, 1910, or over 297 per cent. The following table, which gives the total number of aids to navigation on June 30 of each year named, illustrates the progress in establishing aids in the Territory:

Aids.	1910	1911	1912	1913	1914	1915	1916
Lights.....	37	71	85	93	108	112	147
Fog signals.....	9	10	10	10	10	10	11
Buoys.....	84	105	132	136	157	167	181
Daymarks.....	30	29	38	40	44	49	49
Total.....	160	215	265	279	319	338	388

The act of October 22, 1913, made an appropriation of \$115,000 for a light and fog-signal station at or near Cape St. Elias, and the sum of \$60,000 for the establishment of aids to navigation and the improvement of existing aids in Alaska was included in the sundry civil act approved August 1, 1914. Work on both was started promptly and good progress has been made. Due to exceptional weather conditions, an entire year has been gained in the building of the Cape St. Elias lighthouse, which went into commission on September 6, 1916. Under the appropriation for Alaskan aids, 36 new lights were established, in addition to other needed improvements.

Pending the completion of the new lighthouse tender *Cedar*, the steamers *Kukui* and *Fern* care for lighthouse work in Alaska.

Administrative Methods and Economies.

The third annual conference of lighthouse inspectors was held during January and February, 1916. The program followed the previous general lines, and the results were beneficial to the Service

A new edition of the Instructions to Employees, conforming to the revised regulations, was issued during the fiscal year for the guidance of persons in the Lighthouse Service.

Systematic inspections of the various lighthouse districts by the general inspector, examiner, and officers of the Bureau were continued as in former years with satisfactory results.

The standard method of cost keeping was continued as usual.

The Medical Handbook for use of Stations and Vessels was extensively revised and improved by the addition of a chapter on first-aid methods for the injured. Reprints of this edition have been ordered by other Government services engaged in maritime work.

An Executive order was issued on October 6, 1915, upon my recommendation, permitting laborers in charge of lights whose duties require only a portion of their time to hold other appointments under State or municipal offices, subject to proper restrictions.

After careful study, a readjustment of pay of lighthouse keepers was put into effect during the year, which it is believed has created more equitable conditions, considering particularly isolated and undesirable stations.

The usual lists of spare property in lighthouse districts available for transfer to other districts were issued for the information of inspectors. Special instructions were also given regarding the disposition by sale of condemned rope, cordage, and waste paper, to assist in relieving the shortage of paper material.

In view of the unusual trade conditions existing at this time and the extraordinary advance in price of many materials used in the Service, special instructions were issued governing the preparation of requisitions by inspectors, in order that contracts might be reduced so as to come within available funds.

Steps were taken in several lighthouse districts to overhaul and replenish libraries furnished for light stations and vessels in accordance with instructions heretofore issued on the subject.

At the conclusion of the Panama-Pacific International Exposition at San Francisco, to which reference was made in my report for 1915, arrangements were made for the transfer of portions of the Lighthouse Service exhibit to other expositions at San Diego, Cal., and Panama.

During the fiscal year small exhibits illustrating particular features of lighthouse work were shown at the annual meeting of the Chamber of Commerce of "the "safety-first"

exhibit at the National Museum, and an exhibit of graphic methods, all in Washington, D. C.

Officers of the Bureau were designated as delegates to the Second Pan-American Scientific Congress, held in Washington, and two papers on lighthouse subjects were presented by the Commissioner at regular sessions.

During the fiscal year the Department issued a pamphlet entitled "The United States Lighthouse Service, 1915," published for the purpose of furnishing general information regarding the organization and operation of the Service and to enable the Bureau to supply data asked for in inquiries frequently received.

Engineering and Construction.

New works of principal importance under special appropriations completed during the fiscal year are as follows: Point Judith Breakwater lights, R. I.; Fort McHenry Channel lights, Md.; Norfolk Harbor lights, Va.; Lakes Okechobee and Hicpochee lights, Fla.; Atchafalaya Entrance lights, La.; and Ashland Breakwater light and fog signal, Wis.

Other important work in progress at the close of the fiscal year includes: New carpenter shop at the general depot, Tompkinsville, N. Y.; Charleston Lighthouse Depot, S. C.; Galveston Jetty light and fog signal, Tex.; Navassa Island Light Station, West Indies; Ashtabula, Cleveland, and Lorain Light Stations, Ohio; Manistique light and fog signal, Mich.; and Cape St. Elias light and fog signal, Alaska (since completed).

Several improvements and changes at light stations involved handling unusual weights, which was accomplished without accident. At Sheboygan, Wis., on Lake Michigan, an entire cylindrical steel tower, weighing approximately 30 tons, was transferred from one pier to another, and near Georgetown, S. C., an entire keeper's dwelling, with chimneys and piazza complete, weighing about 115 tons, was moved across Winyah Bay.

The most important item of construction work now under way is the new lighthouse on Navassa Island, West Indies. This will be an unusually tall (152 feet) reinforced-concrete tower built on a height of 250 feet, showing a double-flashing white light at a lateral elevation above the sea of 402 feet.

Constant attention has been given in renewals and replacements to the use of more permanent materials, such as concrete beacons for those formerly of timber, asbestos instead of wooden shingles, etc.

Improvement of Apparatus and Equipment.

A standard tool chest for use at light stations, containing all tools required by keepers for ordinary repair work, has been designed and equipped at the general depot. A similar chest, fitted with pipe and machine tools, for use at fog-signal stations, is also under consideration.

A device for automatically replacing burnt-out incandescent electric lamps has been developed and is now in use at several stations. It consists, briefly, of three lamp sockets mounted radially at 120° on a spring-actuated shaft so that the upper lamp is in the focus of the lens. Should the lamp in service burn out, an electromagnet releases a latch and the shaft revolves 120° , bringing the second lamp in service. Should this lamp also burn out, the third and final lamp is similarly thrown in circuit.

Several remote electrically operated light and fog-signal stations have been placed in operation. Duplicate lamps are provided, with automatic cut-in for the spare lamp, and an arrangement of magneto relays in conjunction with a telephone enables the keeper to use the circuit as a telltale for observing the operation of the fog signal.

Experiments were made to investigate the reliability and degree of accuracy to be expected in obtaining distances at sea by observing the elapsed time between radio and aerial or radio and submarine signals dispatched simultaneously. After several trials it was found that the comparatively short ranges of the whistle or submarine bell under service conditions led to such a brief receiving interval between such signals and radio signals as to make highly accurate observations by a stop watch a necessity, thus limiting the use of such a method from a practical standpoint.

Standard power boats have been designed and built for use at various island stations in the Great Lakes, and after a season's service have proven to be good sea boats, well adapted for the use intended.

Two semaphore signals, the first of their kind employed in the United States Lighthouse Service, have been installed in the Livingstone Channel, Detroit River, Mich., for the purpose of assisting vessel masters in obeying a War Department navigation regulation which requires a time interval of not less than five minutes between down-bound vessels using that channel. By a proper arrangement of lights the signals may be used by night as well as by day.

Radio stations have been installed by the Lighthouse Service in connection with the building of Cape St. Elias and Navassa Island light stations, to which reference has already been made. These are of great value in conducting construction operations in such distant localities.

A small-sized mercury float, weighing about 1,000 pounds, has been designed and built at the general depot for use in lenses of the fourth order and smaller sizes.

Electrically operated flashers, intended chiefly for gas lights on light vessels, have proven very satisfactory, especially for relief vessels, whereby the exact characteristic of any station vessel may be quickly reproduced. This is of special benefit in case of accident to a light vessel, when it may be necessary to relieve the station ship immediately.

The new type of post lantern, designated "Type B," has been issued in considerable numbers and has given satisfaction in withstanding the highest winds, yielding at the same time a satisfactory candlepower. Experiments are in progress toward the development of a single-wick burner, instead of a double-wick, for this lantern.

Standardization of apparatus and repair parts has been kept constantly in mind in planning new installations, and it is believed that this practice will result in a saving in the expense of future work.

A new type of gas buoy, designed by the Lighthouse Service, known as "Type S," and intended for shoal water, was completed, tested, and found satisfactory for use in suitable localities where a small light is sufficient.

Photolithographic drawings of various types of incandescent oil-vapor lamps, oil-engine torches, and post lanterns were prepared during the year and issued to the district offices.

In order to plan ahead as far as possible the installation of new boilers on vessels, special instructions were given in relation to rigid examination of all boilers now in service, so that repairs might be conducted at opportune times.

Appropriations.

In addition to the maintenance appropriations for the current fiscal year, appropriations for the following special works were made by Congress:

Repairing and rebuilding aids to navigation, Gulf of Mexico.....	\$200,000
Light and fog signal, Point Vicente, Cal.	80,000
Improving aids, St. Johns River, below Jacksonville, Fla.....	66,000

Improvements at Woods Hole Depot, Mass.	\$50, 000
Improving aids, Fighting Island Channel, Detroit River, Mich.	25, 000
Additional aids, Florida Reefs, Fla.	75, 000
Improving aids, Hudson River, N. Y.	100, 000
Light and fog signal, Conneaut, Ohio.	63, 500
Light and fog signal, near Kellett Bluff, Wash.	40, 000
Improving aids, entrance to Coquille River, Oreg.	6, 000
Improving aids, Toledo Harbor, Ohio.	15, 000
Light at Dog Island, Me.	3, 500
Improving aids, Delaware River, Pa. and Del.	80, 000
Tender and barge, eighth district, Tex. and La.	20, 000
Additional aids, Mississippi River, La.	50, 000

It has been necessary in submitting estimates for the fiscal year 1918 to ask for an increase in appropriations. The Lighthouse Service has urgent need for additional funds. The cost of all materials has greatly increased; salaries and wages have been uniformly advanced; and in order that the Service may be maintained at a normal standard of efficiency a corresponding increase in its appropriations is necessary.

The estimate for the Bureau of Lighthouses in Washington is the same as the appropriation for the current year. Estimates for 34 special works have been submitted, aggregating \$2,604,300, considering only group 1, of which items amounting to \$1,636,300 are authorized by law. This is \$1,730,300 more than the appropriation for special works for the current year and includes a number of important works for which estimates were submitted last year but which were not included in the appropriations. The estimates include 3 new lighthouse tenders, 3 new light vessels, 1 new light and fog-signal station, 1 new light station, 3 new lighthouse depots, 11 items for establishing or improving aids in general localities, 1 item for a new system of harbor or channel lights and other aids, 5 items for improvements of light or fog-signal stations or of groups of aids to navigation, 3 items for improvement of lighthouse depots, 1 item for improvement of lighthouse tenders, 1 item for light-keepers' dwellings, and 1 item for communication systems to light stations.

In selecting and submitting estimates for those special works believed to be most important, there were considered estimates submitted by officers in the various districts for new lighthouse and ship construction aggregating about \$4,650,000.

Vessels.

The tenders of the Service have been employed to good advantage during the year. The 45 vessels which have been in commission have steamed a total of about 11 miles in

their work of supplying light stations, maintaining the buoyage system, transporting construction materials, and carrying the officers and employees of the Service to their stations or on inspection duty.

Under the appropriation of January 25, 1915, of \$250,000 for the construction of the new lighthouse tender *Cedar*, contract for building this vessel was awarded May 4, 1915, to the Craig Shipbuilding Co., Long Beach, Cal., for the sum of \$234,500. She was under construction throughout the fiscal year, and on October 1, 1916, was 70 per cent completed. Work on the vessel has been delayed by strikes and other causes beyond control of the Lighthouse Service. The *Cedar* will be the largest vessel in the Service and is especially designed for working on the coast of Alaska.

The medium-draft tender *Rose*, for service in the bays and sounds of the seventeenth lighthouse district, was launched on February 19, 1916. The vessel was completed after the close of the fiscal year and was conditionally accepted on August 8, 1916.

The small tender *Fern*, for service in the inside waters of the sixteenth lighthouse district, was completed and placed in commission on June 20, 1915, proceeding to her station of duty on July 1, 1915.

The use of oil fuel is provided for the new tenders for the Pacific coast.

A contract was awarded for a tender, the shallow-draft tender *Palmetto*, on September 27, 1915, for service in the inland waterways of the sixth lighthouse district.

An appropriation of \$20,000 was made by the act of July 1, 1916, for a light-draft tender and barge for use in establishing and maintaining aids along the intercoastal waterways of Texas and Louisiana.

With the increase in the number of aids to navigation and the deterioration of older vessels, it will probably be necessary to construct, on an average, one or two new tenders each year.

Estimates have been submitted for three new lighthouse tenders—one to replace the *Gardenia*, or for general service, at a cost of \$150,000, and two to replace the *John Rodgers* and *Jessamine*, or for general service, as may be found most desirable, at a cost of \$180,000 each. The first of these items was authorized by the act of August 28, 1916, but no appropriation has been made for the purpose.

Radio apparatus was designed and manufactured by the Bureau of Standards for the tenders *Columbine*, *Cypress*, *Orchid*, *Manzanita*, and *Sequoia*. Installation was made on the *Columbine*

and *Cypress*, but deferred on the other vessels owing to lack of funds in the appropriation "Salaries, lighthouse vessels."

The condition of this appropriation also necessitated the laying up of the tender *Lilac* until such time as the shortage may be overcome.

The Lighthouse Service maintains light vessels on 53 stations and has for this purpose 66 light vessels, of which 13 are relief vessels. Some of these vessels are old, 11 having been built over 50 years ago. One is 67 years old. Some of the older vessels are in a condition which does not warrant extensive repairs.

Contracts were awarded for the construction of second-class light vessels *No. 101* and *No. 102* on March 6, 1915. *No. 101* will be placed on station for the present at Cape Charles, Va., relieving *No. 49*, which is to undergo extensive repairs during the present fiscal year, and *No. 102* is intended for station at Southwest Pass Entrance to Mississippi River, La. Good progress had been made by the builder up to the close of the fiscal year.

Plans and specifications have been completed and bids invited for the construction of the new third-class light vessel *No. 99*, and plans and specifications are in preparation for the new first-class light vessel *No. 100*. A contract for the construction of light vessel *No. 99* was awarded on June 29, 1916.

On account of the deterioration of older vessels it will be necessary to construct one or more new light vessels each year.

Estimates have been submitted for new light vessels for general service on the Great Lakes, where they are much needed to replace vessels which must soon be withdrawn from duty; for a new light vessel for station off Cape Charles, Va.; and for a light vessel for the Gulf coast or for general service. The act of August 28, 1916, authorized the vessels for the Great Lakes, at not to exceed \$150,000, and the vessel for Cape Charles, at \$130,000, but no appropriation was made.

The work of raising Buffalo light vessel *No. 82*, referred to in the report for 1914, was completed and the vessel successfully floated on September 17, 1915. The work of repairing and reconstructing the vessel was nearly completed at the end of the fiscal year.

Careful attention has been paid in designing and remodeling light vessels to making all parts of such vessels accessible for cleaning and painting. The use of internal-combustion engines has also been extended, which it is believed will effect an economy in maintenance.

Cooperation.

In accordance with the established custom of the Service, every effort has been continued to consult the needs of maritime interests and to cooperate effectively with other branches of the Government in matters relating to the work of the Lighthouse Service.

By my authority, deck officers of lighthouse tenders were designated to assist in the examination, under the Steamboat-Inspection Service, of applicants for certificates as lifeboat men required by the seamen's act of March 4, 1915.

The Bureau has further cooperated with the Steamboat-Inspection Service in detailing officers to make stability tests of merchant vessels under examination by that Service.

In connection with marking fishing limits on the Middle Atlantic coast, representatives of the Lighthouse Service attended various hearings held by United States Engineer officers and furnished assistance in the matter of suggestions for lighting fish pounds or the marking of fishing limits, and since then the Service has aided the War Department in placing buoys to mark the limits prescribed by that Department.

The Lighthouse Service also placed a special buoy to mark the fishing grounds off Beaufort, N. C., in connection with work of the Bureau of Fisheries. This Service also assisted the Bureau of Fisheries in collecting samples of sea water for analysis at designated light stations. The plans and specifications of the Fisheries steamer *Halcyon* were prepared in cooperation with the Bureau of Fisheries, and consulting advice was given that Bureau in connection with repairs to the Fisheries steamer *Roosevelt*.

Assistance was rendered the Coast and Geodetic Survey in placing special buoys needed for offshore surveying operations, and various special buoys were also placed for the Navy Department in connection with torpedo and gun practice by naval vessels.

The Public Health Service rendered valuable assistance to the Lighthouse Service in preparing the Medical Handbook and List of Remedies, referred to elsewhere in this report, and also in the matter of sanitary advice, inspections, and fumigations at various stations and vessels of the Lighthouse Service.

The Bureau of Mines continued to assist the Lighthouse Service in making analyses of coal, and detailed information was furnished that Bureau, at its request, in reference to coal purchased by the Lighthouse Service on contracts providing for analysis.

Arrangements were continued with the War Department for the use of lighthouse tenders for mine-planting practice, the Department of Commerce offering the service of such vessels when they can be spared, without reimbursement where the service does not exceed two days.

Joint regulations with reference to the matter of the proper authority to prescribe and supervise lights on certain structures in navigable waters during their construction period and providing for the transfer of such authority upon completion of the structures were issued by the Chief of Engineers, United States Army, and the Lighthouse Service, with the Department's approval.

Arrangements were made with the Hydrographic Office of the Navy Department for the transmission of important reports received affecting an aid to navigation by telephone or telegraph to the proper lighthouse inspector.

The Board of Supervising Inspectors of the Steamboat-Inspection Service adopted a resolution providing that service on vessels of the Lighthouse Service shall be considered, for raise of grade, equal to similar experience obtained on merchant vessels.

Observations made on various lighthouse reservations created as bird reservations under the Department of Agriculture indicate that successful results have been attained in increasing the number of migratory birds frequenting such reserves.

Examinations and reports have been made by the Forest Service in reference to timber on various lighthouse reservations, particularly on the Great Lakes, under the authority of the act of March 3, 1915.

Traveling and Subsistence Expenses of Teachers Employed in Instructing the Children of Keepers of Lighthouses.

The State of Maine, which is in the first lighthouse district, has put in operation an arrangement for a traveling school teacher to visit the outlying light stations in the State where school facilities for children are lacking to give instruction to the children at the stations. The State pays the salary of the teacher, who is transported to and from the light stations by lighthouse tenders where necessary. The State also furnishes books. The keepers, however, are obliged to provide subsistence for the teacher at their own expense. One teacher at present covers 14 light stations, following a regular schedule. An objection is the short period spent by the teacher at each station, which is only about two weeks. It is hoped this condition may be improved by the State

providing more teachers. At Matagorda Island Light Station, Tex., in the eighth district, a similar system is in effect. If the United States Government would authorize the payment of subsistence of teachers, it would be possible to make the same arrangement in other States. I recommend that this be done.

Taking the Lighthouse Service as a whole, it is inevitable from the nature of the Service that many light stations are situated where school facilities are not accessible. Under existing law it is not practicable for the Lighthouse Service to take any direct measures toward the education of the children of the keepers. The matter is given careful attention, however, and the Regulations of the Service provide that in the event of vacancies permitting transfer to light stations convenient to school facilities preference must be given to keepers and assistant keepers having children between the ages of 5 and 16 years who have not now access to schools, provided they desire such transfer and their service and qualifications entitle them to it. Moreover, when other conditions are equal, inspectors are instructed not to recommend for appointment or transfer to stations not accessible to schools keepers having children of school age unless such keepers give assurance that they will make proper provision for the education of their children. Since this regulation went into effect there has been a noticeable improvement as to the number of stations where children of school age are without educational facilities. Inspectors are required at stations not accessible to schools to inquire from time to time into educational conditions for the children and to encourage any course which will lead to their suitable education, consulting, when desirable, with State and local educational authorities. The Lighthouse Service provides circulating libraries for the light stations and has recently taken measures to furnish a number of stations with a useful dictionary, more of which will be supplied as funds permit.

Legislation Affecting the Lighthouse Service.

The following is a summary of special legislation affecting the Lighthouse Service, other than appropriations, enacted during the fiscal year 1916:

The act of June 28, 1916, authorized the Secretary of Commerce to exchange the land now occupied by the Schooner Ledge Range Front Light Station at the mouth of Crum Creek, Pa., for other lands adjacent thereto, and authorized the removal of the present station after certain conditions have been complied with.

The act of June 2, 1916, authorized the sale of the lighthouse reservation at Fortunate, Ind., to the town of Fortunate or representative as in above amendment.

The act of August 2, 1916, amendment to the same of the fiscal year, granted authority for the following purposes:

Exchange of rights of way of the United States in connection with aids pertaining to the Lighthouse Service for such other rights of way as may be advantageous to the Service, providing also for the payment of any expenses, not exceeding \$5,000, incurred by the United States in making such exchange from the appropriation "General expenses, Lighthouse Service."

The establishment and maintenance, in the discretion of the Commissioner of Lighthouses, of post-auxiliary lights and other aids to navigation in the Mobile, Tombigbee, Warrior and Black Warrior Rivers, Ala., and Lake Tangue, La. and New

The purchase, necessary equipment, repair, and operation of one motorcycle for the use of the Lighthouse Service in the Hawaiian Islands.

Medical relief for light keepers and assistant light keepers without charge at hospitals and stations of the Public Health Service, and providing also for certain physical examinations of persons who enter the Service hereafter.

The following works were authorized by the same act, at the limits of cost named, but no appropriation of funds was made: Light keepers' dwellings, \$75,000; light vessels for the Great Lakes, \$300,000; lighthouse depot for second district, \$65,000; lighthouse tender for third district, \$150,000; improvements at Great Salt Pond, R. I., \$25,000; improvement of offices and laboratory, Tompkinsville, N. Y., \$21,000; improving aids, East River, N. Y., \$60,000; light vessel off Cape Charles, Va., \$130,000; improving aids leading to Cape Charles City, Va., \$12,300; improving aids, eastern shore of Chesapeake Bay, Md. and Va., \$29,000; rebuilding light station, Point Fortinquen, P. R., \$85,000; improving aids, Huron Harbor, Ohio, \$4,500; improving aids, Fairport Harbor, Ohio, \$42,000; improving aids, Keweenaw Waterway Harbor of Refuge, Portage River, Mich., \$110,000; improvements at Detroit Depot, Mich., \$53,000; light and fog signal, Sand Hills, Mich., \$75,000; improvements, Manitowoc North Breakwater, Wis., \$21,000; rebuilding light station, Chicago Harbor, Ill., \$142,000; improving aids, Indiana Harbor, Ind., \$100,000; aids to navigation, Alaska, \$60,000; establishing and improving aids,

Washington and Oregon, \$35,000; temporary depot at Honolulu, Hawaii, \$5,000; lighthouse depot for nineteenth district, \$90,000; and radio equipment for lighthouse tenders, \$60,000.

Retirement of Aged or Disabled Employees.

A marine officer of the Lighthouse Service who has served for 40 years recently told me he hoped for the coming of a retirement system which would provide something for his old age after so many years of faithful work. A provision for the retirement of employees of the Lighthouse Service who after long service have lost their ability for further active duty by age or disability arising from their work is essential to full efficiency in administering the Service. In the Army, the Navy, the Marine Corps, and the Coast Guard, including those who serve on the Coast Guard cutters, such a retirement system now exists. The result is an unjust and, I think, an unintentional discrimination against those who serve in one service and in favor of those who serve in others. The men who man the lighthouse ships and who serve in the various light stations give their lives to the Government as truly as does an Army or Navy officer. Many of them would by reason of their special knowledge be required to aid our military forces in time of war.

The Lighthouse Service is in many respects a dangerous service. By every rule of administration and of humanity and by the precedent of the practice both in our own Government in other services and of other governments as respects this particular kind of work, these men are entitled to retirement pay.

In the annual report of the Commissioner of Lighthouses for the fiscal year 1912, page 29, is a statement showing the practice of foreign countries with reference to pensioning employees in other lighthouse services. This shows that a retirement system is in force with favorable results in all of the countries mentioned. The record is one of unenviable isolation and inaction on our part.

On April 24, 1916, the Senate unanimously passed a bill which in its present form provides for the optional retirement of officers and employees of the Lighthouse Service at the age of 65 years after 30 years' service and for compulsory retirement at the age of 70 years. The retirement pay would be at the rate of one-fortieth of the last annual pay for each year of active service, not to exceed thirty-fortieths. The measure has my cordial approval and the warm indorsement of the Senate Committee on Commerce backed by its unanimous passage. It is pending in the House of

Representatives, and I earnestly hope it may soon be enacted into law. It has been recommended in the annual reports of the Lighthouse Service every year since 1910. It ought now to be done and done quickly.

Increase in Limit of Cost of Outbuildings at Light Stations from \$200 to \$500.

The provision, now contained in the appropriation for general expenses, Lighthouse Service, authorizing the construction of outbuildings at a cost not to exceed \$200 at any one light station in any fiscal year was first enacted in the sundry civil appropriation act for the fiscal year 1902. Since that time the increase in cost has been approximately 40 per cent for labor and from 50 per cent to 125 per cent for the materials used in the construction of such buildings. It is figured that a building which in 1902 cost \$200 to construct would now cost from \$300 to \$325.

It is not, however, on account of the increased cost of construction alone that the Department recommends the proposed increase in the limit of cost for outbuildings at light stations. It has been found by experience that the maximum of \$200, even under the conditions existing in 1902, was too low to permit erecting buildings of an economical type. The result has been that several small buildings for various purposes have been put up at a station in different years, in order not to exceed the fixed limit of cost. This saves no money, but loses it. The maintenance is greater, the efficiency is less, and an unsightly appearance on the station premises is produced. The total cost of several outbuildings at a station spread over a period of two or three years is as great as or greater than that of a single building, of proper construction and appearance, which would serve all the purposes if constructed at one time in one fiscal year under the higher limit of cost proposed. It is also advisable to erect all buildings, so far as practicable, of fire-resisting materials. This means a higher initial cost than is the case with wooden structures such as have been used heretofore. The increase proposed in the maximum limit of cost will result in economy and efficiency.

Communication Systems to Light Stations.

A general inquiry was made during the year respecting means of communication by telegraph and telephone between light stations and other Government coastal stations and the general communication system of the country. At my suggestion a conference of representatives of the various departments interested

in coastwise communication of all kinds was held in the office of the Commissioner of Lighthouses in December, 1915. As a result of this conference the President, by Executive order, on February 16, 1916, authorized the Interdepartmental Board on Coastal Communications, comprised of representatives of the following departments: Treasury, War, Post Office, Navy, Agriculture, and Commerce. This board is giving continued consideration to this important subject.

An item has been included in the estimates for the fiscal year 1918 of \$100,000 for use in cooperation with the Coast Guard, and in harmonious development with broad plans prepared by them, to furnish telephone or telegraph communication between the more important light stations, Coast Guard stations, and principal interior points.

An element of this same subject is the equipment of lighthouse tenders with wireless. Pursuant to existing authority of law, the sum of \$60,000 has been included in the estimates for the next fiscal year, and the estimate for "Salaries, lighthouse vessels," has been made to include the cost of the necessary operators.

Increase in Pay and Subsistence Allowance of Crews of Lighthouse Vessels.

There has been much difficulty throughout the year on all the vessels of the Service in maintaining efficient crews at the wages which the existing appropriations have made necessary. The work of the crew of a lighthouse tender is in a true sense technical. It differs essentially from the ordinary work of the crew of a steamer. It includes that ordinary work, and a great deal more. It requires practice over a continued period for crew as well as for officers to handle in a seaway the large buoys in the regular work of placing and replacing them at sea. Many of the stations are in dangerous places, and both life and property are risked if the crew is inefficient or inexperienced. Continuity of service means economy of results. Valuable vessels and costly buoys may at any time be damaged by careless or ignorant handling. Even life itself has been sacrificed for the same cause.

The landing of supplies at light stations is difficult and sometimes dangerous work, not required of crews in the merchant service. The Bureau of Lighthouses ought to be able to pay at least the same monthly wage to seamen that they would receive on a merchant ship. It does not now do so and can not do it, and the officers of the vessels and of the Service at large are embarrassed and hampered in their work through this fact and must

continue to be so until sufficient appropriations are given to correct it.

The officers of the lighthouse vessels deserve commendation for standing loyally by the Service at a time when they are paid less than they could obtain elsewhere for the same work or indeed for work less exacting. In some cases vessel officers have left the Service to find promotion and larger compensation elsewhere, but as a whole the officers have stood loyally by their work. The efficiency of the lighthouse work depends upon these men. They have a peculiar training valuable in time of peace and invaluable in time of war. The Lighthouse Service has my approval in its desire to pay these men what they earn and what they could easily get elsewhere, but this can not be done without an increase in the available appropriations.

A respectful petition for an increase in wages was sent to the Service on September 26, 1916, by the officers of the tenders in the third (New York) district. This says, truly, "It is a well-established fact that private and municipal corporations have been paying men who are engaged in similar occupations a much larger salary than that paid by the Government," and they add, with equal force, "The reason which actuates us to present this petition arises from the present economic conditions, which are, no doubt, known." They are right. They ought to have the increase they ask.

The question of subsistence of crews is also a serious one. The prices of all articles of food have greatly advanced, as everybody knows, but the allowance for subsistence has not changed and can not change until appropriations are increased. Already serious complaints are made, and with justice. The seaman's life is one of hard labor out of doors in all weathers and subject to great exposure. He ought to have abundance of good food and a great Government should not so act as to restrict him in this respect. I put great stress, therefore, upon a sufficient increase in our appropriations to enable us to feed our sailors properly.

The Lighthouse Service, by reason of the peculiar nature of its work, covering all climates from the Arctic Ocean to the Caribbean Sea, and requiring provisions for homes, for vessels, and for its own technical and construction work, has to purchase a great variety of commodities. It is almost needless to say that every one of these has greatly increased in cost. The appropriations remain fixed, but the prices on which goods have to be paid for out of those appropriations are not so fixed. A dollar appro-

priated in the summer of 1916 for possible expenditure in the spring of 1917 will not have the same value at the later period that it had when appropriated. As a matter of fact, it has been greatly reduced in purchasing power in the interval elapsed. While the utmost care, therefore, is given in purchasing to buy in such quantities and by such methods as will make the money go to the farthest cent, it is still impossible to operate at anything near the former costs in this respect. For these reasons also additional appropriations have been asked for the fiscal year 1918.

Inadequate Salaries of Lighthouse Inspectors.

These officers now receive \$2,400 per annum except in the third district, where the salary is \$3,000 per annum. The lighthouse inspector is charged by the Regulations of the Lighthouse Service with the following duties:

Supervision of all the work of the district in which he is assigned to duty, and he is responsible under the Commissioner for its efficient and economical administration.

He is responsible for the proper management of the light stations, fog-signal stations, light vessels, relief light vessels, lighthouse tenders, and depots; for keeping upon their stations in proper condition all floating aids to navigation; for the maintenance, repair, and operation of all lighthouse craft permanently or temporarily in the district; for the construction of new aids or additions to aids; for the repair, cleanliness, and efficient condition of all aids to navigation and other property in the district; for keeping ready for service at the shortest notice all spare or relief moorings, buoys, buoy appendages, and relief light vessels; for the distribution of supplies; for the efficiency of the personnel; for the approval of vouchers and accounts covering the disbursement of funds as may be authorized on account of the Lighthouse Service; and for such other duties as are involved in the proper conduct of the district or as may be from time to time assigned to him.

In carrying out these duties the inspector is to exercise a constant and watchful supervision over all district affairs, as well as over the officers and men in the service, so as to maintain the district in a high state of efficiency. He shall keep advised of the needs of navigation as respects aids to navigation in his district.

Each inspector has Government property under his care of an average value of \$3,000,000. Each has under his supervision an average of 280 employees. Each supervises disbursements that average \$304,000 per annum. They are obliged to have technical knowledge of their work, business ability to handle that work economically, vigilance in protecting navigation, engineering knowledge and experience, nautical knowledge and experience, ability to act on independent initiative, since they average a distance of 1,300 miles from headquarters, and there is frequent occasion for immediate action in emergency. They must also have ability to cooperate with representative citizens and local and Government officers in the localities where they are sta-

tioned to further the needs of navigation. The statement printed on page 54 shows that these men are paid much less than other officers of the Government whose responsibilities are no greater and who have no higher technical education or standards. These inspectors are technical men, having in their care property of great value, supervising great areas, making large expenditures, bearing heavy responsibilities. They are underpaid for the work they do. These loyal public servants are entitled to a just compensation for the services they render. They do not now receive it. Our estimates for the coming fiscal year, therefore, have been made upon the basis of the advance suggested in my last report, namely, from \$2,400 to \$3,000.

Saving of Life and Property.

During the fiscal year 1916 services in saving of life and property were rendered and acts of heroism performed by employees of the Lighthouse Service on vessels or at stations on 161 occasions, a list of which is appended.

In each of these cases a commendatory letter was issued by me, and in the case of the rescue of the bark *British Yeoman* by the lighthouse tender *Columbine*, Frank T. Warriner, commanding, on January 17, 1916, near Port Allen, Kauai, Hawaii, under unusually difficult and dangerous conditions, the President of the United States expressed his appreciation of the services rendered by the officers and crew of the *Columbine*.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1916.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
1st.....	C. H. Newman, keeper, Pumpkin Island Light Station, Me.	Motor boat.....	Towed to port disabled motor boat with 2 men on board. Boat leaked badly.
	E. T. Holbrook, keeper, Isle au Haut Light Station, Me.	.....do.....	Towed to harbor disabled motor boat with 4 men on board.
	Do.....	.....do.....	Towed to station disabled motor boat with 5 men on board. Furnished men with food and shelter.
	J. H. Peaseley, keeper, Crabtree Ledge Light Station, Me.	.....do.....	Towed disabled motor boat with 1 person on board to shore.
	H. G. Sawyer, keeper, Bear Island Light Station, Me.	.....do.....	Towed disabled motor boat with 1 man on board distance of 3 miles to harbor.
	Tender Hibiscus.....	Schooner Hilda Emma..	Prevented schooner, which had parted anchor chains, with no one on board, from going on rocks in Moosabec Reach and probably becoming total loss.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1916—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
1st.....	C. F. Chester, keeper, Owlshead Light Station, Me.	Power launch.....	Assisted 2 fishermen whose launch struck ledge and was in sinking condition. Furnished them food, shelter, and dry clothing.
	J. W. Haley, keeper, Perkins Island Light Station, Me.	Rowboat	Prevented waterlogged rowboat, loaded with lumber and with man on board, from capsizing; lumber saved.
	Do.....		Furnished party which had taken refuge on island during heavy thunderstorm with dry clothing and shelter.
	J. E. Purington, keeper, Nash Island Light Station, Me.	Schooner Maine.....	Towed schooner which had lost her foremast in squall 3 miles with station boat.
	Tender Hibiscus.....	Cunard Liner Armonia..	Recovered anchor and 90 fathoms chain lost off Portland Light Vessel.
	F. O. Hilt, second assistant keeper, Matinicus Rock Light Station, Me.		Endeavored to save man who fell overboard while hauling nets. Recovered body.
2d.....	H. C. Towle, keeper, The Graves Light Station, Mass.	Motor boat.....	Towed motor boat, with 2 men aboard, in heavy sea, to safe anchorage; repaired boat and furnished men food and shelter.
	E. C. Hadley, keeper, Bakers Island Light Station, Mass.	Power boat; William B. Durand, owner.	Rescued sinking power boat, made repairs, and delivered to owner.
	E. C. Mott, assistant keeper, Deer Island Light Station, Mass.	Power boat Alice; John McBride, owner.	Towed disabled boat to station; fed and lodged 11 men.
	M. N. Huse, keeper, Narrows Light Station, Mass.	Launch Nautilus; George H. Walker, owner.	Prevented launch, grounded on Lovells Island, from capsizing.
	A. A. Howard, keeper, Stage Harbor Light Station, Mass.	Catboat Trilby; Ernest W. Chaplin, owner.	Towed catboat in distress to anchorage in harbor.
	J. E. H. Cook, keeper, Cape Ann Light Station, Mass.	Power boat; F. H. Gile, owner.	Towed disabled power boat to Rockport.
	J. B. McCabe, keeper, and E. C. Mott, assistant keeper, Deer Island Light Station, Mass.	Power boat Madeline; Richard Brown, owner.	Towed disabled motor boat, with 4 men on board, to safe anchorage.
	M. N. Huse, keeper, Narrows Light Station, Mass.	Motor boat.....	Rendered assistance to motor boat with 3 persons on board.
	H. M. Bailey, first assistant keeper, and C. R. Albrecht, second assistant keeper, Minots Ledge Light Station, Mass.	.....do.....	Rendered assistance to motor boat disabled in breakers. Kept boat afloat until coast guards arrived.
	L. B. Clark, keeper, Cuttyhunk Light Station, Mass.	Schooner Child Harold.	Prevented vessel from being driven farther on shoal by informing master of his position.
	Tender Azalea.....	Tug Saddle Ross, with barge Sharon in tow.	Towed disabled tug, with barge in tow, to dock.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1916—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
2d.....	A. F. Snow, master, Great Round Shoal Light Vessel No. 86, Mass.	U. S. S. San Francisco...	Rendered assistance to officer and 8 men adrift from stranded ship. Supplied clothing, food, and shelter.
3d.....	Tender Daisy.....	Power boat Crit.....	Towed stranded and abandoned power boat to boat club.
	Tender Gardinia.....	James Howmes.....	Rescued from drowning in Hudson River.
	J. Murdock, keeper, Rondout Light Station, N. Y.	Motor boat Natalie; John H. Flannery, owner.	Rendered assistance to disabled motor boat.
	Tender Daisy.....	Power boat Porto.....	Towed power boat, adrift on Lake Champlain, with 6 people on board, 5 miles to Plattsburg.
	Tender Larkspur.....	Yacht Onward III; J. A. Still, owner.	Towed yacht, in distress, into harbor.
	Tender Gardinia.....	Schooner Highland.....	Towed schooner, in danger of sinking near Fort Wadsworth, New York Bay, and beached in safety.
	W. F. Rhodes, keeper, Romer Shoal Light Station, N. Y.	Thomas F. Leland and James Heavy, of Staten Island.	Rescued men whose boat had capsized, and supplied with clothing, food, and lodging; boat recovered.
	C. R. Riley, keeper, Stamford Harbor Light Station, Conn.	British schooner W. N. Zuricker, Capt. J. L. Pribbickover.	Rendered assistance to vessel ashore near Stamford Harbor.
	G. L. Hoxsie, keeper, Castle Hill Light Station, R. I.	Launch Thomas Shea; harbor master, Newport, R. I., owner.	Towed disabled launch to Newport.
	F. A. Jordan, sr., keeper, Penfield Reef Lights, Conn.	Auxiliary sloop Amelia..	Assisted in floating vessel aground on reef.
	J. R. Carlson, keeper, Bergen Point Light Station, N. J.	Bergen Point Light Station, N. J.	Saved light station from fire caused by burning oil cans and oil barge.
	E. A. Ottenburgh, keeper, Whitehall Narrows Lights Nos. 8, 10, and 12, N. Y.	.....do.....	Rescued 2 men from drowning while attending lights.
	E. M. Grant, keeper, Stepping Stones Light Station, N. Y.	Power boat Helen.....	Towed disabled boat to Low Barrows.
	Do.....	Power boat.....	Towed disabled power boat to station; furnished men with lodging and food; repaired engine.
	J. Carlson, master, and A. H. Neilson, seaman, Ram Island Reef Light Vessel, N. J.	.....do.....	Towed disabled boat, containing 3 persons, to Noank, Conn.
4th.....	A. Johnson, keeper, Ship John Shoal Light Station, N. J.	.....do.....	Rescued disabled and leaking launch and with difficulty towed it to safe anchorage. Service resulted in probable saving from drowning of occupant.
	C. E. Rickards, first assistant keeper, and C. H. Hickman, second assistant keeper, Harbor of Refuge Light Station, Del.	Power boat of Torpedo Boat No. 61.	Towed disabled launch, with 9 men aboard, to torpedo boat; was drifting out to sea.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1916—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
4th.....	M. A. Duffield, keeper, Deepwater Point Range Rear Light Station, N. J.	.....	Gave shelter, quilts, and blankets to employees of Du Pont Powder Works burned in an explosion.
	W. Spear, keeper, Deepwater Point Range Front Light Station, N. J.	.....	Transported boy with fractured arm to hospital at Wilmington, Del., for treatment.
	S. Tessadri, second assistant keeper, Fourteen Foot Bank Light Station, Del.	Gasoline yacht Lillian V.	Cared for crew of launch which broke shaft in vicinity of station.
	G. A. Holston, laborer in charge, Lewes Lighthouse Depot, Del.	Motor boat.....	Towed disabled launch, with party of fishermen, drifting to sea, into Delaware Breakwater.
	W. Spear, keeper, Deepwater Point Range Front Light Station, N. J.	Motor launch Montie, of Camden, N. J.	Towed disabled launch in heavy squall, containing 4 persons, into Salem Canal.
5th.....	J. T. Shipp, keeper, Neuse River Light Station and Point of Marsh Light, N. C.	Motor boat Clara S., Capt. E. B. Pobst.	Assisted occupants after motor boat became disabled.
	A. J. English, keeper, Harbor Island Bar Light Station, N. C.	Schooner M. L. Davis; Isiah Davis, owner.	Floated loaded schooner grounded on Harbor Island Bar, N. C.
	J. T. Shipp, keeper, Neuse River Light Station and Point of Marsh Light, N. C.	Launch Susie Swindell.	Assisted several men and children in disabled launch.
	T. D. Quidley, assistant keeper, Neuse River Light Station and Point of Marsh Light, N. C.	Gas freight boat Nelson; Capt. Murray Nason, owner.	Rendered assistance to disabled boat.
	I. C. Meekins, assistant keeper, Croatan Light Station, etc., N. C.	Peter G. Gallop, keeper, Croatan Light Station, etc., N. C.	Rescued keeper from drowning.
	Tender Jessamine.....	Schooner James H. Hargraves.	Towed derelict from midchannel to Cornfield Harbor, Md.
	W. G. Rollinson, keeper, Hatteras Inlet Light Station, N. C.	Fishing boats.....	Rendered assistance to boats in distress, each having 1 man aboard.
	W. J. Tate, keeper, North Landing River, etc., aids, N. C.	Tug Adelaide, Capt. William Bonsal.	Floated tug grounded near Long Point, N. C. Furnished water and provisions.
	Tender Laurel.....	Sloop Silver Spray, Capt. T. J. Williams.	Towed disabled sloop to harbor.
	W. G. Rollinson, keeper, Hatteras Inlet Light Station, N. C.	Steamship M. G. Walenstein; George K. Rollinson, owner.	Pulled disabled steamship off Hatteras Reefs; towed to harbor and landed passengers.
	Tender Maple.....	Schooner Lina James....	Pulled schooner clear of ice into free water.
	Tender Holly.....	Schooner D. J. Whealton	Floated schooner which had gone ashore on Kemmons Flats, James River, Va.
	J. T. Shipp, keeper, Neuse River Light Station, etc., N. C.	Motor boat; G. G. Paul, Bayboro, N. C., owner.	Rendered assistance to disabled motor boat and furnished occupant with food.
	W. H. Davis, jr., keeper, Lazaretto Lighthouse Depot, Md.	.....	Attempted to rescue drowning man.
	H. C. Wingate, watchman, Lazaretto Lighthouse Depot, Md.	.....	Do.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1916—Continued.

District	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
5th	W. J. Tate, keeper, North Landing River, etc., aids, N. C.	Gasoline freighter Centitude.	Assisted in floating freighter.
	Do.		Saved raft from stranding.
	S. R. Van Hunter, keeper, Thomas Point Shoal Light Station, Md.	Gasoline launch Rex; John D. Johnson, Baltimore, Md., owner.	Rendered assistance to disabled launch.
6th	O. P. Olsen, assistant keeper, Baltimore Light Station, Md.	Yacht Lela.	Rendered assistance to yacht which had run ashore.
	J. Lindquist, keeper, and W. Lindquist, assistant keeper, Mosquito Inlet Light Station, Fla.	Yacht Mema.	Assisted in pulling yacht off shoal.
	C. P. Honeywell, keeper, Cape Canaveral Light Station, Fla.	Yacht Viola II, of Philadelphia, Pa.; Marshall Jones, Jr., owner.	Assisted in repairing yacht in distress.
	H. S. Svendsen, keeper, South Channel Range Lights, S. C.	War Department launch No. 19.	Towed disabled launch in Charleston Harbor to wharf at Fort Moultrie.
	I. Larsen, depot keeper, Castle Pinckney, S. C.	Launch.	Assisted in mooring launch, grounded near depot, in safe place and transported crew to Charleston.
	C. Seabrook, second assistant keeper, Cape Romain Light Station, S. C.	Schooner Luther F. Garrison.	Transported captain and 7 of crew who had landed on beach to station; furnished food and clothing.
	Tender Mangrove.	U. S. S. K-5.	Searched for U. S. S. K-5 when communication with vessel was lost.
	Do.		Rescued man in drifting boat outside Port Royal Sound, S. C.; put him ashore and boat in safe anchorage.
	Tender Cypress.	Tug Henry Buck, of Charleston, S. C.	Assisted in extinguishing fire.
	L. H. Bringlee, keeper, Charleston Light Station.		Found body of man washed ashore on Morris Island. Reported to coroner.
7th	A. A. Burn, first assistant keeper, Tybee Range Front, etc., Lights, Ga.	Small boat.	Rescued 3 soldiers from Fort Screven, Ga., adrift in a small boat.
	H. S. Svendsen, keeper, South Channel Range Lights, S. C.	U. S. Navy launch.	Pulled navy yard launch off bank in Sullivan's Island Cove.
	Tender Arbutus.	Power yacht Bon Temps.	Towed disabled and sinking yacht to safe anchorage, and furnished food and quarters to 10 persons.
8th	W. B. Thompson, keeper, and C. C. Sapp, assistant keeper, Sabine Pass Light Station, Tex.		Maintained characteristic of light by hand during hurricane.
	A. B. Modawell, keeper; J. Brew, first assistant keeper; J. W. Gauthier, second assistant keeper; and U. M. Gunn, third assistant keeper, Sabine Bank Light Station, Tex.		Maintained light during hurricane.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1916—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
8th.....	H. C. Claiborne, keeper; J. P. Brooks, first assistant keeper; and C. T. Morris, second assistant keeper, Bolivar Point Light Station, Tex.		Maintained characteristic of light by hand during hurricane.
	G. R. Smith, keeper, and L. R. Smith, assistant keeper, Red Fish Bar Cut Light Station, Tex.		Maintained light during hurricane.
	S. Gibbon, keeper, and J. D. Balsillie, assistant keeper, Brazos River Light Station, Tex.		Maintained light during hurricane by hand.
	W. Hill, keeper, Calcasieu Range Light Station, La.		Maintained light and made effort to save Government property during hurricane.
	E. Danley, keeper, Pascagoula River Entrance Lights, Miss.		Displayed energy in making repairs and recovering Government property during hurricane.
	F. A. Schrieber, keeper, Lake Borgne Light Station, Miss.		Maintained light under trying conditions during hurricane.
	F. H. Johnstons, foreman, eighth district.		Maintained light and made temporary repairs, replacing storm panes destroyed in hurricane.
	T. Zettwoch, keeper, West Rigolets Light Station, La.		Maintained light under trying conditions during hurricane.
	C. Riddle, keeper, New Canal Light Station, La.		Do.
	J. P. Groux, keeper, Chefuncte River Light Station, La.		Do.
	H. A. Succow, keeper, and J. W. Sharp, assistant keeper, Pass Manchac Light Station, La.		Do.
	W. W. Bayly, keeper; M. Durabb, first assistant keeper; and J. C. Welch, second assistant keeper, Chandeleur Light Station, La.		Do.
	A. Rodi, keeper, and S. Coludrovitch, assistant keeper, South Pass East Jetty Light Station, etc., La.		Do.
	C. W. Heartt, keeper, Cubits Gap Light Station, La.		Do.
	J. W. St. G. Gibbon, keeper, and C. T. Thomassen, assistant keeper, Head of Passes Light Station, etc., La.		Do.
	E. Grandison, laborer in charge, Ironton Light, La.		Constructed temporary beacon and exhibited the light during hurricane.
	Miss A. Meyer, laborer in charge, Shingle Point Post, La.		Exhibited light from tree in vicinity of destroyed beacon during hurricane.

SAVINGS IN LIVES AND PROPERTY BY TENDERS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE IN 1906, THE FISCAL YEAR 1906—Continued.

Station	Name of employee performing service	Vessel or subject	Nature of assistance
100	W. C. Miller, keeper, Tensas Bay Light Station, La.		Maintained light under trying conditions during hurricane.
	J. C. May, keeper, and J. P. Anderson, assistant keeper, Tensas Bay Light Station, La.		Do.
	J. McNamee, keeper, W. H. Myers, first assistant keeper, and J. J. Leland, assistant keeper, and W. P. Barker, third assistant keeper, Ship Island Light Station, La.		Do.
	H. A. Moore, sales officer, and C. Allen, machinist, tender Sunflower.	Marionedijk; Tensas Transport & Terminal Co., agents, New Orleans, La.	Rendered service in diving to unwind the hawser of steamship Marionedijk, entangled in propeller of the tender Sunflower while assisting disabled steamship.
	J. W. H. G. (Stinson), keeper, and C. T. Thompson, assistant keeper, Head of Passes Light Station, La.	Gasoline launch; owner unknown.	Brought men and boy to station and furnished them food and gasoline.
	J. Ayshford, keeper, and H. T. Dickinson, first assistant keeper, Galveston Harbor Light Station, Tex.	Launch; owner unknown.	Towed disabled launch for distance of about 9 miles to Galveston, Tex.
	Tender Sunflower	Steamship Turrialba; United Fruit Co., New Orleans, La., owners.	Assisted in floating vessel ashore in South Pass of the Mississippi River.
	Do.	Lighter, U. S. Engineer Department, New Orleans, La.	Attempted to pull lighter off west bank of Mississippi River in vicinity of Head of the Passes.
	Tender Camella	Launch Oralle; owner unknown.	Towed disabled launch to Lake Borgne, La.
	Do.	Launch Simon; owners unknown.	Towed launch containing 8 persons to wharf at Galveston, Tex.
	P. A. Schrieber, assistant keeper, Round Island Light Station, Miss., and N. Nihon, keeper, Pangloss River Range Light, Miss.	Schooner Henry M.; owners unknown.	Furnished crew with clothing and food and towed schooner to place of safety.
	M. McCluskey, J. Christianson, and H. Grove, seamen, Southwest Pass Light Vessel No. 43, La.	Southwest Pass Light Vessel No. 43, La.	Rendered service under hazardous and trying conditions during hurricane.
101	J. Hale, assistant keeper, South Buffalo Light Station, N. Y.	Airship	Assisted 8 men who, with disabled airship, had dropped into the water.
	C. Pittmorris, keeper, West Water Island Light Station, Ohio.	Yacht Dorothy E.	Assisted owners in getting proper anchorage near light station during gale.
	Do.	Yacht Argument	Assisted crew when yacht was driven ashore on island.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1916—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
10th....	A. Shaw, jr., keeper, Presque Isle Light Station, Pa.	Tug Henry B. Gillen...	Endeavored to obtain assistance for tug which stranded on bar, and cared for articles washed ashore.
11th....	Tender Clover.....	Launch Hoodoo; Wm. Bousho, owner.	Rescued disabled launch containing 5 persons.
	P. H. Garraty, keeper; G. J. Hassett, first assistant keeper; and A. Brock, second assistant keeper, Middle Island Light Station, Mich.	Yacht Irvington; E. M. Haywood, owner.	Removed women passengers from vessel aground.
	W. G. Marshall, keeper, and F. McFall, assistant keeper, Windmill Point Light Station, Mich.	Motor boat.....	Towed disabled motor boat to safety.
	E. Van Natta, keeper, Grassy Island South Channel Range Light Station, and H. W. Noel, keeper, Grassy Island North Channel Range Light Station, Mich.	Motor boat; L. Cuneaz, owner.	Towed disabled launch with 8 passengers aboard to shore.
	E. Van Natta, keeper, Grassy Island South Channel Range Light Station, Mich.	Small scow.....	Towed small scow beyond control, with 4 boys aboard, to safety.
	T. E. Dee, keeper; E. Byrne, first assistant keeper; and W. S. Hall, second assistant keeper, Point Iroquois Light Station, Mich.	Motor boat Leora; John Bourne, owner.	Rescued disabled motor boat in sinking condition.
	T. E. Radcliff, second assistant keeper, Tawas Light Station, Mich.	Rowboat.....	Rescued rowboat adrift with 2 boys aboard.
	F. G. Sommer, keeper, and A. Hetu, first assistant keeper, Detour Light Station, Mich.	Tug Caselle.....	Brought members of crew of disabled vessel ashore for purpose of making repairs.
12th....	C. A. Stram, keeper, and M. Weiss, assistant keeper, Cana Island Light Station, Wis.	Motor boat Martha S., Oconto, Wis.	Pulled boat which had run on rocks out of danger.
	A. C. Erickson, keeper, Little Traverse Light Station, Mich.	Launch.....	Towed disabled launch with 1 occupant into harbor.
	O. C. McCauley, keeper, Squaw Island Light Station, Mich.	Fish tug Two Sisters, St. James, Mich.	Rendered assistance to disabled tug.
	A. C. Mann, second assistant keeper, Calumet Harbor Light Station, Ill.	Son of H. Wentworth, 1600 South Dearborn Street, Chicago, Ill.	Rescued from drowning.
	F. A. Drew, keeper, Green Island Light Station, Wis.	Gasoline steamer Starlight, of Marinette, Wis.	Assisted in getting stranded steamer off reef.
	W. Ottosen, keeper, and R. G. Petersen, second assistant keeper, Pilot Island Light Station, Wis.	Motor boat.....	Towed disabled motor boat with 3 occupants out of danger and repaired engine.
	S. M. Danielsen, keeper, Chicago Harbor Light Station, Ill.	.....	Rescued 5 men marooned on break-water during storm and took them to safe landing.

REPORT OF THE SECRETARY OF COMMERCE

SAVES OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1906—Continued.

Station	Name of employee rendering service	Vessel etc., aided.	Nature of assistance.
1976	J. Robinson, keeper; E. Evans, first assistant keeper and; E. Evans, second assistant keeper, Mackinac Pierhead Range Light Station, Mich.	motor launch.	Assisted in preventing motor launch from ice to summer-house cottage near station.
	C. J. Howell, keeper, Chicago Pierhead Range Light Station, Ill.		Rescued from drowning man who had fallen off pier.
	H. Carless, master, and A. Weston, engineer, Light Vessel No. 5	Motor fish boat Whynot.	Towed motor boat to light vessel.
	J. J. Robinson, keeper, and R. B. Lathrop, assistant keeper, Chambers Island Light Station, Wis.	Motor boat Starlight, Marinette, Wis.	Gave food and clothing to 3 shipwrecked sailors whose motor boat was destroyed by fire, and took men over to Marinette, Wis.
	H. W. Johnson, keeper, and M. Tolson, first assistant keeper, North Manitowish Island Light Station, Mich.	Motor boat Alice L.	Assisted in landing disabled motor boat, putting on beach, and re-launching after rudder had been repaired.
	H. W. Johnson, keeper, and M. Tolson, first assistant keeper, North Manitowish Island Light Station, Mich.	Motor fish boat Whynot.	Assisted in running motor boat.
	C. C. McCauley, keeper, Snow Island Light Station, Mich.	Fish launch Ram B.	Towed disabled launch to Beaver Harbor, Mich.
	J. Kilgore, keeper, Grand Haven Pierhead Range Light Station, Mich.		Rescued 2 men of U. S. Coast Guard in danger of being carried into Lake Michigan by ice.
	F. J. Armstrong, keeper, Michigan City East Pierhead Light Station, Ind.		Rescued 2 men from drowning.
	F. J. Armstrong, keeper, and P. Stryker, second assistant keeper, Michigan City East Pierhead Light Station, Ind., and J. H. Muckian, assistant keeper, Calumet Pierhead Light Station, Ill.	Fish tug Eagle.	Assisted in releasing vessel from ice.
	M. Robinson, keeper; H. Guly, first assistant keeper; and A. G. Pichtner, second assistant keeper, Calumet Harbor Light Station, Ill.	Motor launch Mary Lee; A. G. Brandenburg, 6117 Greenwood Avenue, Chicago, Ill., owner.	Rescued disabled motor launch in danger of being crushed against pier.
	Tender Sumac	Steamer Hennepin; Capt. J. A. Braunell, Lake Shore Steamer Co., First National Bank Building, Milwaukee.	Worked off vessel aground in White Lake, Mich., into deep water.
	Tender Hyacinth	Steamer German	Worked off vessel ashore on shoal off Rowley Bay, Wis., into deep water.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE SERVICE DURING THE FISCAL YEAR 1916—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
12th....	J. McCormick, keeper; William F. Green, first assistant keeper; and Ray H. Buttars, third assistant keeper, South Fox Island Light Station, Mich.	Motor boat.....	Pulled off disabled boat, containing 3 men, ashore on Fox Island and towed her to fish tug.
16th....	Tender Kukui.....	Gasolineschooner Favorite, of Cordova; Bing Halleck, captain and owner.	Rescued captain, engineer, and 1 other person from shipwrecked schooner.
	Tender Fern.....	Small gasoline boat; William Bowers, owner.	Towed disabled boat, and owner suffering from blood poisoning in arm, to Petersburg, Alaska.
	Tender Kukui.....	Three-masted schooner P. J. Abler; J. E. Shields, owner.	Rendered assistance and beached vessel, which was afire.
	Do.....		Searched for party of 3 men and gas boat Francis R., employed by Bureau of Fisheries.
	Geo. A. Lee, keeper, Tree Point Light Station.	Launch Violet; Johnson Russ, owner.	Furnished gasoline.
	N. S. Douglas, keeper, and S. L. Atkinson, assistant keeper, Lincoln Rock Light Station.	Launch from U. S. S. Patterson.	Furnished food to occupants.
	S. A. Ellings, first officer, tender Fern.	Thomas G. Neile.....	Rescued demented man, who had plunged overboard, from attempted suicide.
17th....	Relief Light Vessel No. 92.....	Motor fishing boat.....	Rescued 2 men from disabled boat and kept them on board overnight.
	H. P. Score, keeper, Slip Point Light Station, Wash., with assistance of son Walter.	Motorboat Bunch; Hugh Wickersham in charge.	Rescued disabled boat from dangerous position and towed to safe anchorage.
	L. A. Petterson, keeper, West Point Light Station, Wash.	Small sailboat; Harry Christensen, owner.	Rescued man from drowning whose boat had capsized; furnished dry clothing.
	W. S. Denning, keeper, and S. B. Morris, assistant keeper, Robinson Point Light Station, Wash.	Motor boat.....	Rescued man, wife, and 2 small children from disabled boat near station. Furnished food and clothing.
18th....	J. A. Picone, launchman; G. T. Olsen, keeper; P. Chekles, first assistant keeper; and L. G. McKay, second assistant keeper, Mile Rocks Light Station, Cal.		Rescued from drowning man fallen or jumped overboard from passing steamer.
	L. R. Willard, assistant keeper, Oakland Harbor Light Station, Cal.		Rescued fisherman from drowning by capsizing of boat.
	Tender Madrono.....	Navy tug Vigilant.....	Towed disabled tug from city front to Goat Island wharf.
	Light Vessel No. 23, Cal.....	Steamer Bear.....	Cared for 160 passengers and crew of wrecked steamer Bear; supplied dry clothing and provisions.

SAVING OF LIFE AND PROPERTY BY VESSELS OR EMPLOYEES OF THE LIGHTHOUSE
SERVICE DURING THE FISCAL YEAR 1916—Continued.

District.	Vessel or employee rendering service.	Vessel, etc., aided.	Nature of assistance.
18th....	W. M. Greene, second assistant keeper, San Luis Obispo Light Station, Cal. R. H. Williams, keeper, Point Arena Light Station, Cal.	Small boat from steamship Roanoke. Gasoline schooner Alliance No. 2.	Sighted and assisted in bringing in boat from steamship Roanoke; 5 dead and 3 nearly unconscious. Sighted disabled launch near breakers; notified Coast Guard crew; 1 man rescued.
19th....	Tender Columbine..... Do.....	Bark British Yeoman... Steamer Mikahala.....	Saved vessel and all on board from almost certain destruction, through heroic efforts of officers and crew of Columbine, during progress of a gale off Port Allen, Hawaii. Pulled grounded vessel off reef on exposed shore of Molokai.

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SAVING UP LIFE AND LIVING
SERVICES

NAME ADDRESS

1. W. J. Lawrence
2. George S. ...
3. ...
4. A. B. Williams
5. ...

6. ...

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COAST AND GEODETIC SURVEY.

last annual report the efficiency of this Bureau has been improved by changes in the organization. The results achieved since this reorganization confirm the wisdom of the

accompanying diagram outlines the units of the divisions of the Bureau as they are to-day. (See fig. 1.) These units will be understood by the synopsis of the duties which follows:

Of Assistant in Charge.

The assistant in charge has charge of the upkeep and management of the buildings occupied by the Bureau, approves the purchase and distribution of all instruments and miscellaneous supplies required, receives and accounts for all moneys realized from the sale of publications and condemned property and for work done for outside parties. He also has charge of the leave records of the personnel of the Bureau as well as the shipments to and from the office at Washington.

Attached to the office of the assistant in charge are these sections, each under the supervision of a chief:

1. Instrument section.
2. Printing and sales section.
3. Library and archives section.
4. Miscellaneous section.

The functions of these various sections are outlined below.

Instrument section.—This section designs, makes drawings for, and supervises the construction of new instruments and parts thereof which are required in the operations of the Service. The chief of this section is also charged with the responsibility, care, upkeep, issue, and accounting for all instruments and general property of the Service, involving packing, unpacking, shipping, and receiving instruments and general property.

Printing and sales section.—This section attends to the printing of charts on plate and lithographic printing presses from the copper or aluminum plates and the sale and distribution of these charts and other nautical publications. As a part of the office of the assistant in charge, and closely related to the printing and

sales section, there is maintained an electrotype shop, where electrotypes are made of the copper printing plates.

Library and archives section.—This section has the keeping of the original records of field observations and the technical library of books and periodicals maintained by the Bureau.

Miscellaneous section.—This section is charged with the purchase of supplies and equipment for the field and office work and maintains a store of stationery for the office and field forces, as well as the blank books for field observations.

Division of Geodesy.

This division is under a chief and an assistant chief. The province of the division of geodesy is principally the extension of the network of precise leveling throughout the United States and Alaska for the control of levels run by other Government bureaus, by State and city officials, as well as by private individuals and corporations; the determination of geographic positions by triangulation or traverse for the control of Federal, State, and county boundaries and other engineering work in all parts of the United States and Alaska; also the determination of field astronomical positions and the establishment of stations at which the intensity of gravity is determined.

The triangulation and traverse done in the interior of the United States and of Alaska are of a primary nature and are used as bases of control for the detailed triangulation and traverse by organizations which make topographic or other surveys. Along the coast the triangulation done by the Survey comes either directly or indirectly under the division of geodesy. It is of a detailed nature, intended for the control of topographic and hydrographic surveys made by parties of the Bureau in the construction of nautical charts.

These may be considered the field operations of the division.

In the office the observations made in the field are computed and adjusted and the results are prepared for publication.

About 90 per cent of the work of the division is purely practical and of immediate commercial value. Equally important, however, is the work of research into the scientific phases of geodetic work, such as the determination of the shape and size of the earth and of the variation of the densities in the outer portion of the earth.

The Survey has made valuable contributions to science along these lines in recent years.

Division of Hydrography and Topography.

Under this division are carried on the various hydrographic and topographic surveys and resurveys along the coasts of the United States, Alaska, and our insular possessions, which include Porto Rico, Hawaiian Islands, Philippines, and approaches to the Panama Canal. This division also supervises the Bureau's four suboffices, located at New York, Galveston, San Francisco, and Seattle.

Under the supervision of the chief of the division of hydrography and topography are these sections:

1. Section of field work.
2. Section of field records.
3. Section of vessels and equipment.
4. Section of coast pilot.
5. Section of tides and currents.

The duties assigned to these are as follows:

Section of field work.—The chief of this section prepares outlines of survey projects, formulates plans for their execution, advises the division on the conduct of all field operations, and has charge of the division in the absence of its chief.

Section of field records.—In this section the records of the field observations made under the direction of the division of hydrography and topography are reviewed, departures from approved methods are indicated for correction, and practices worthy of adoption are noted for the use of the Service. In cooperation with the other sections of the division, especially the section of field work, the results of the examination of the field records are utilized in planning and directing the field work.

Section of vessels and equipment.—This section has charge of the purchase and maintenance of vessels and all equipment of hydrographic and topographic parties. It prepares plans and specifications and supervises the repairs to the fleet and the construction of new vessels. Its duties include inspection of the vessels, their equipment and personnel.

Section of coast pilot.—This section collects information for and compiles the coast pilots and inside route pilots for the coasts of the United States and its insular possessions. The field work of the section enables its members to advise the chief of the division of the condition of the surveys and discrepancies in the published charts.

Section of tides and currents.—This section, from data obtained from observations made at the different tidal and current stations

maintained by the Bureau and from other available sources, prepares the annual Tide Tables and furnishes tidal and current data for other nautical publications of the Survey and for the public.

Division of Charts.

Under a chief and assistant chief this division constructs new charts and keeps existing charts up to date, maintaining complete indexes and diagrams of all surveys, reports of dangers, harbor improvements, and changes of lights and buoys; engraves the copper plates from which the charts are printed; and does the photographic work for the Bureau.

The following sections, under separate chiefs, are under the chief of the division:

1. Section of drafting.
2. Section of engraving.
3. Section of photography.

Section of drafting.—This section compiles surveys and other information for new charts, new editions, and new prints; furnishes the compilation drawing for the engravers or finished drawings for the lithographers; verifies the proofs of all engraved work or the successive color prints for each lithograph chart; and does the miscellaneous drafting for the Bureau.

Section of engraving.—From the compilation drawings furnished by the drafting section this section engraves the charts on copper printing plates, making a new plate for new charts and correcting existing plates to bring them up to date where changes have occurred.

Section of photography.—This section furnishes reproductions of hydrographic and topographic field sheets and record books, geodetic and tidal computations, and does miscellaneous photographic work.

Division of Terrestrial Magnetism.

Under the direct supervision of a chief and assistant chief this division supervises the magnetic observations in the field and at the observatories, their computation in the office, the discussion of the results, and their preparation for publication in the form of tables and magnetic maps, and as compass data on the charts.

Division of Accounts.

Under a chief this division examines and adjusts the accounts for every expenditure by the Bureau and also disburses the moneys appropriated for the Bureau.

Results of Changes in Organization.

By the new organization each of the numerous scientific and practical details of the work of the Survey receives the care of an officer who has had experience in the subject. The former organization was unwieldy, and the business of the Service was so congested that a project could not be thoroughly studied before its execution. There has been developed out of this disorder a clear and regular procedure by which the work, much simplified, moves in an orderly way to a definite result.

Another result of the changed organization is the acceleration in producing the Survey's charts. Recently the demand for the charts of the Bureau has so grown that the facilities for making them were taxed as never before.

Under these conditions it soon developed that a change was necessary in the former methods. The section having charge of the printing of the charts and that which had their sale and distribution under its care, theretofore separate, were combined. When this change was made, 200 charts were out of print and there was a demand for 6,703 copies of charts which could not be supplied. Within a short time after the change the number of charts out of print was reduced to 25 and the number of copies of charts that could not be supplied to meet the demand had been reduced to 904. Nearly as many charts were printed during August, 1916, as during the three months of July, August, and September of the previous year.

The Bureau disposes of its charts through agents. In the past, however, but little attention was paid to the nature of the stock crried by each agent. Little more was done than to hold them financially accountable for what they received. During the year forms were prepared by which each agent is required at stated intervals to report exactly the charts on hand and the dates to which same have been corrected. By this process there have been weeded out of the stocks in the hands of the Bureau's agents during the last year over 11,000 charts either obsolete or misleading. To-day the stocks of charts in the hands of the agents are more nearly up to date than ever before.

The various suboffices of the Service have also been made distributing points for charts.

Inadequate Housing Facilities.

I renew the criticism in my last report of the buildings occupied by the Coast and Geodetic Survey. They are fire-inviting,

inadequate, and unsanitary. Erected at first for a hotel, a residence, and a stable, always unfitted for their present use, their unsuitableness was never more emphasized than now. The greatly increased activities of the Service, creating a greater volume of work, tend to further demonstrate the unfitness of these structures as a working tool. By constant care they are made to look fairly well superficially to a careless eye, but as a matter of fact they are a burden of expense. It is useless to spend more money on them, and it is most unfortunate that we have been obliged to spend nearly \$6,000 in providing new boilers and heating equipment for them. Conditions would be bad enough if they were office buildings only, but when they contain a printing plant, a machine shop, a carpenter shop, and a lithographic plant, and are also used as storerooms for valuable records and for goods intended for sale, the condition becomes serious. It is a daily waste of money to use them. The proposed new Commerce Building should be so designed as to take in all the operations of the Coast and Geodetic Survey and provide it with ample room and facilities for its important work. Bad as the structures are as working tools, the danger to invaluable public records involved in their continued use is more serious.

Eight thousand field sheets are stored among the archives which have cost and are to-day worth many millions of dollars. (See figs. 2 and 3.) Every effort is made to protect them, but it is impossible to do so in the present quarters. The only facilities for fire protection are hand fire-extinguishers. There is no fire hose or water main in the building. The nature of the old structures obliges much of the work to be handled in an awkward manner.

Engravers and draftsmen must have good light. This requires us to scatter them in order to have light sufficient, and hence time is lost going back and forth for consultation and information. One room for each section properly lighted should provide adequate space for this work.

The engraving section is far removed from the storage for the copper plates. These plates have to be carried a distance of 300 feet over seven flights of stairs, and during the last year nearly 40 tons of paper had to be carried by hand to the presses because there was no place for it near them. The accompanying illustrations (figs. 4 and 5) give an idea of the present conditions.

Some of the rooms used as offices are two stories below street level and always use artificial light.

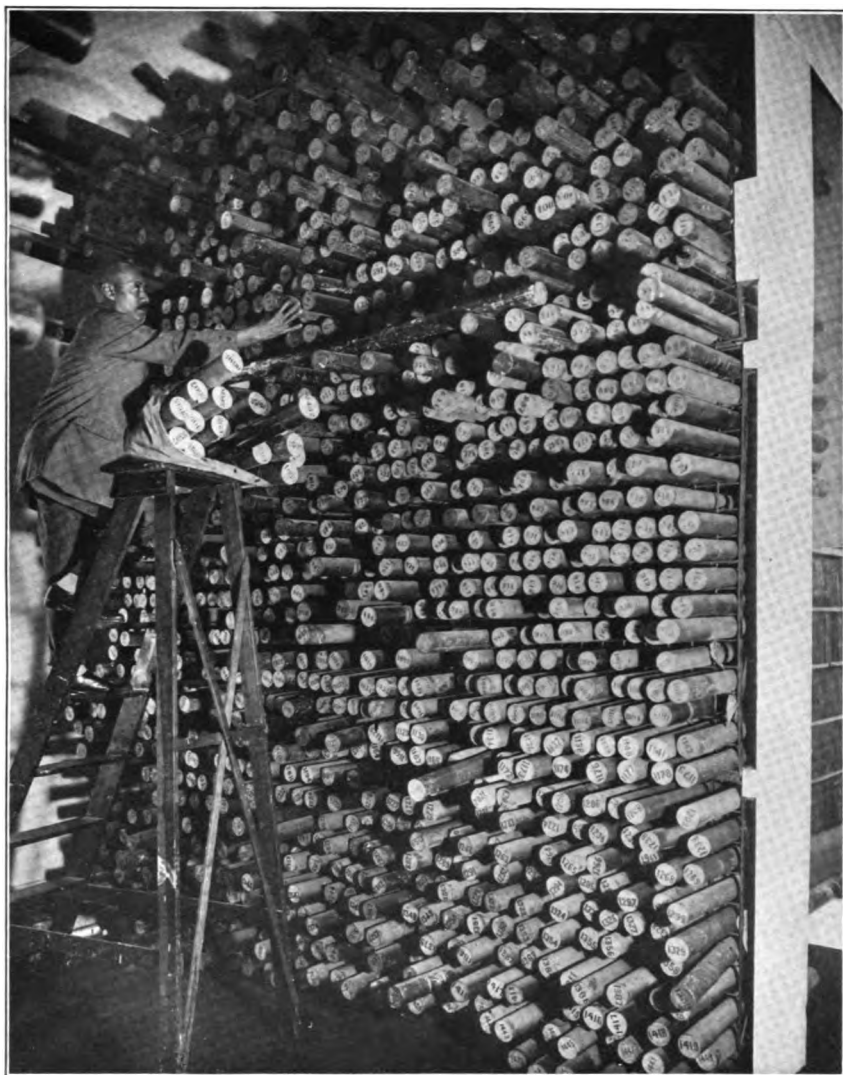


FIG. 2.—Original field sheets of the Coast and Geodetic Survey filed in the archives in steel racks extending from floor to ceiling. No water system for fire protection.



FIG. 3.—Method of moving original sheets, Coast and Geodetic Survey.

Several of these 70-pound sacks of original sheets are carried each day between the drafting rooms and the archives, a distance of 350 feet and over four flights of stairs.



FIG. 4.—*Carrying copper plates, Coast and Geodetic Survey.*

Transporting engraved plate from storeroom up one of seven flights of stairs and a distance of 300 feet to engraving room for correction. The plates average 42 pounds in weight. About 96 tons' weight is thus transported annually.



FIG. 5.—Method of carrying paper to Presses, Chart and Graphic Rooms.
Showing how nearly 80,000 pounds of chart paper must be carried annually from the work room to the presses at a distance of 175 feet and down one flight of stairs, ending in bulk of an elevator.



Fig. 6. Machine for Cost and Gradation Survey.

It must be realized, of course, that the rapid growth in the American merchant marine brings extraordinary demands upon this Service. One can not reason from a period as recent as 1913 to the conditions which exist to-day. The outlook is for even greater pressure upon our facilities, for the number of ships building in the United States was never as great as on October 1, 1916. If the statements made concerning the demands of the work of the Coast and Geodetic Survey are viewed in the light of the report herein on the Bureau of Navigation, the conditions will be easily understood.

Mechanical Engineer for Instrument Section.

It is purposed in the estimates for 1918 to alter the designation of the chief of the section of instruments to that of "mechanical engineer," with an increase of salary from \$2,400 to \$3,000. E. G. Fischer, the present incumbent, is a mechanical engineer of exceptional ability who has designed many new, delicate, and intricate instruments. Among those of notable value is the tide-predicting machine used by the Service, which is the admiration of the world. His latest achievement is the development of a new electric signal lamp for use in observations for triangulation at night. This lamp, which is illustrated herein (see fig. 8), has a beam candlepower of 250,000, a marked advance in efficiency over the lamp of 1,500 beam candlepower which has heretofore been used. The new lamp has been adopted by private parties and Government bureaus, including the United States Navy, the Forest Service, the Coast Guard, the Aeronautic Service, and by manufacturers also of mine-rescue apparatus. The modest salary now asked for a public servant who can do constructive work of this character is small by comparison with that which would be paid a man of equal productive value in private service.

Systematic Distribution of the Bureau's Charts and Publications.

Requests by persons and corporations for such information as the magnetic variation of the compass at a given point at a period long past and at the present time, in order to locate land boundaries; for the elevation of a point above the sea level; and for the Bureau's nautical charts, etc., are so vaguely and often so inaccurately addressed that it is forced upon us that these people (and doubtless many others) have a real need but lack information as to the branch of the Government service that can supply that need.

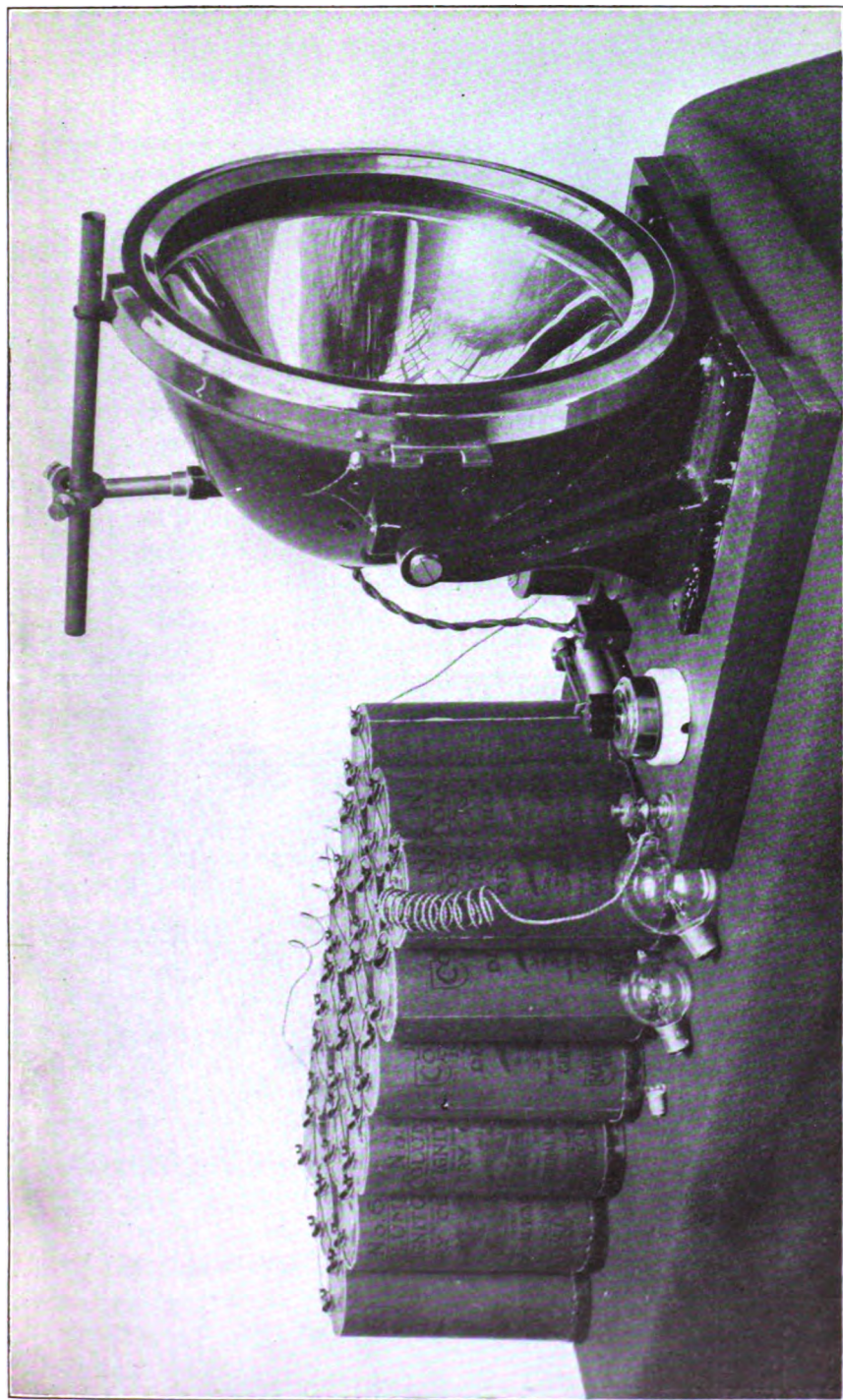


FIG. 8.—New electric triangulation signal lamp, Coast and Geodetic Survey.

Yields at 100 feet 250,000 beam candlepower, with 9-volt, 2.5-ampere special bulb developed in the Survey.

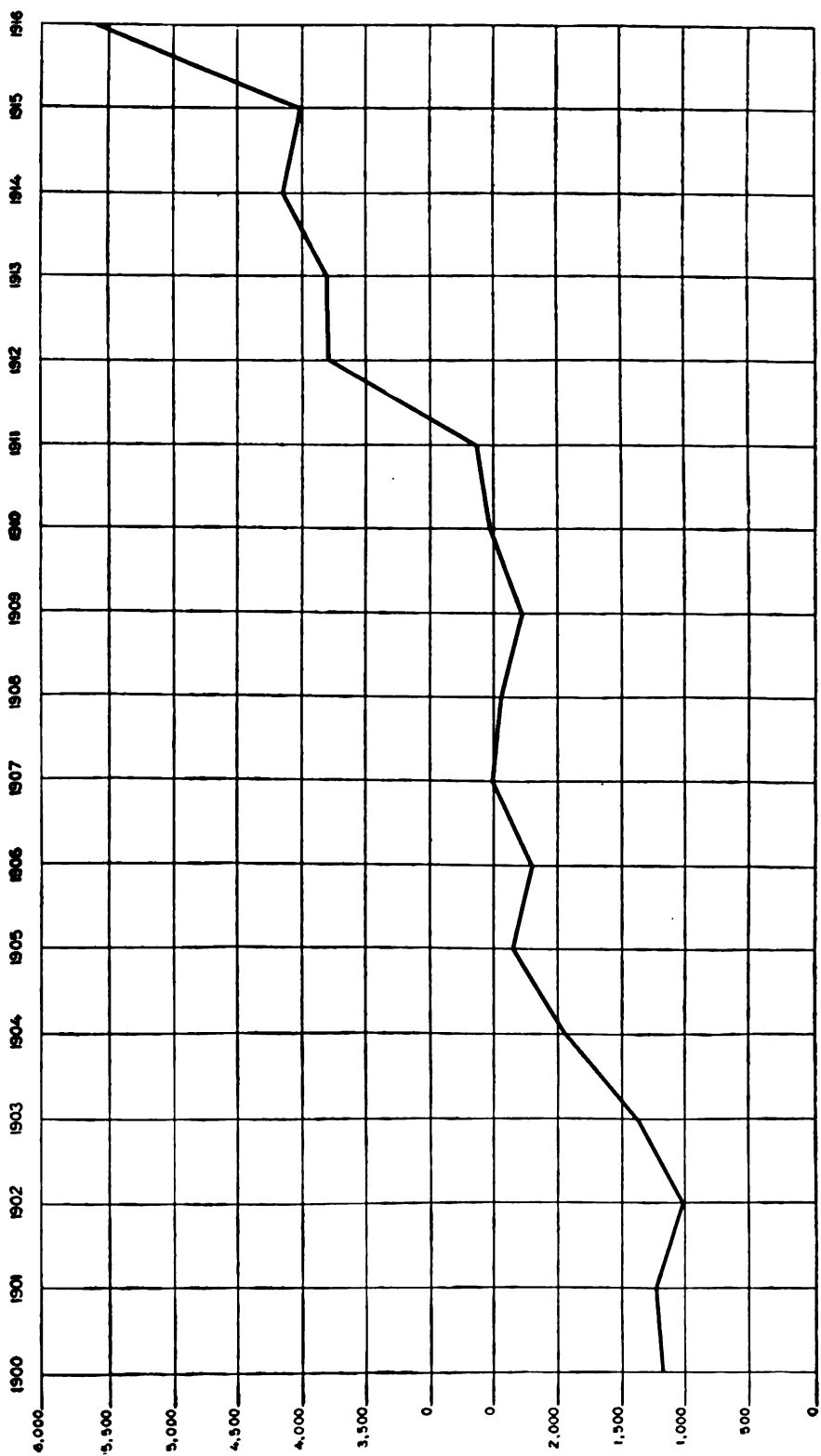


FIG. 9.—Annual distribution of Coast Pilots, issued by the Coast and Geodetic Survey, 1900-1916.

To remedy this, and to bring to the public attention the data that have cost so much and are essential to many public enterprises and private projects, there is need of a well-thought-out announcement regarding each publication as it comes from the press which will reach the greatest number concerned with the least expenditure in advertising, and that will prevent the free distribution of expensive publications to those who are merely curious.

With the means at hand the Bureau has undertaken in a small way to carry on such a campaign of education. Requests were forwarded to each chamber of commerce of the important coast cities asking that the Bureau be given lists of the steamship companies and wharves located at those ports, as well as of the yacht clubs there and in the vicinity. Cooperation by everybody was surprisingly responsive. Since securing this information the Bureau has sent a letter to each steamship company when a new chart was published or a new coast pilot was issued. A poster has been prepared, to be placed on the wharves and in the yacht clubs, calling attention to the particular publications and charts of the Bureau and giving a list of agencies where these charts and nautical publications could be purchased.

Heretofore it was the custom of the Bureau to make the surveys, compile information, publish a chart, and supply such demands for it as came in, leaving the public to learn of the existence of the chart as best it could. Recently the Bureau published the usual edition of a chart of Long Island Sound above New York City. Simultaneously with its publication prepared notices were sent to the newspapers in the locality of the waters covered by the chart calling attention to this new chart and giving the particulars regarding it. Almost instantly the demand for this chart was so great that the usual edition was exhausted. This chart was first issued April 29, 1916. Within four months the Bureau had received orders for nearly 1,700 copies of it. There is no question that this demand resulted from the newspaper announcements concerning it.

There are numerous instances of this kind where with proper public announcement the information that is so necessary and has cost so much can be in the hands of those whom it benefits rather than be uselessly stored in Washington. How to do this without an extravagant distribution of publications to persons ordering them through curiosity alone is a matter that is being given earnest consideration.

Printing Office Needs.

The request is renewed for a new printing press, transfer press, and a modern cutting machine. These new facilities in this office will greatly increase its efficiency.

New Suboffices.

Suboffices in Boston, Norfolk, and Juneau and funds to maintain the Galveston office, which now occupies quarters furnished by local public organizations, are needed. At a small cost it would be possible to place in each a local inspector, who, by coming in contact with local conditions and nautical people, would greatly increase the value of the Bureau to the public and materially increase the information it could gather in the course of each year regarding local nautical conditions.

Two New Vessels for the Pacific Coast and Alaska.

In last year's estimates two new vessels were asked for to take the place of the *Gedney*, which was sold a year ago, and the *Patterson*, still in the service, but old, weak, and unfit for the work that is expected from her in the protection of the waters on the Pacific coast.

Congress felt that the replacing of these vessels should be deferred for the time. This request for these two new vessels for the Pacific coast is renewed with the earnest hope that the increasing need of surveys on the Pacific coast will be recognized. It may be well to add here that both the *Patterson* and the *Explorer* will, necessarily, require repairs this year. In view of the age of both these vessels, it is unwise to make extensive repairs to them. It has never been more evident that extraordinary efforts should be made to keep up with the rapid progress of the Pacific coast and Alaska and to safeguard the waters on which they depend for transportation. Alaska up to 1913 had been in a more or less dormant state. Within three years the Territory has developed wonderfully; the new railroad is being built to tap the interior, and her exports and imports have increased from sixty-one millions of dollars to about one hundred millions of dollars. The work of making surveys, which was backward before this increased activity, has not kept pace with the development of this vast Territory.

It is essential that these new vessels, now asked, be furnished in order to survey with the least possible delay the great coastal areas of central and western Alaska.

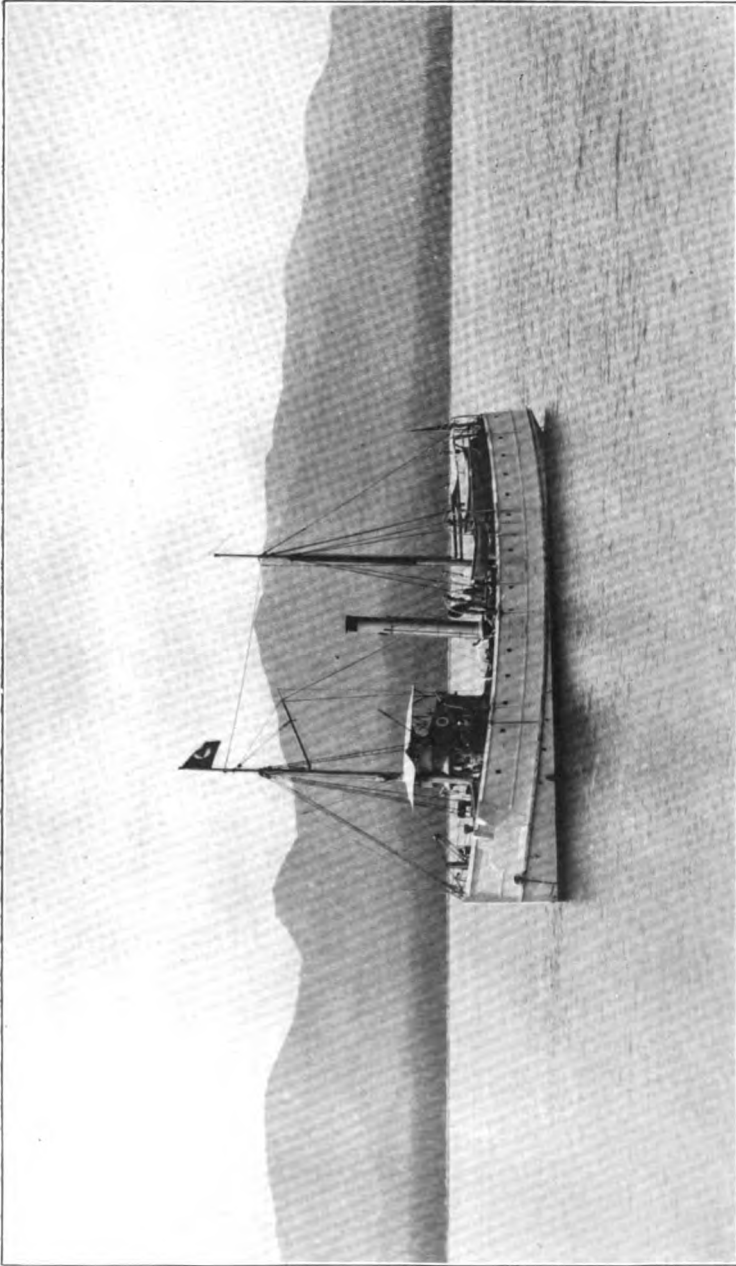


FIG. 10.—*Coast and Geodetic Survey vessel "McArthur."*

Wooden steam vessel of 99 tons displacement, 20 gross tons, and 130 net tons; registered length 115 feet, breadth 20 feet, draft 12 feet; indicated horsepower 250; speed 8.5 knots; coal capacity 48 tons; complement 7 officers and 30 men. Built at the Mare Island Navy Yard, Cal., in the year 1876. Condemned and sold on February 8, 1916.

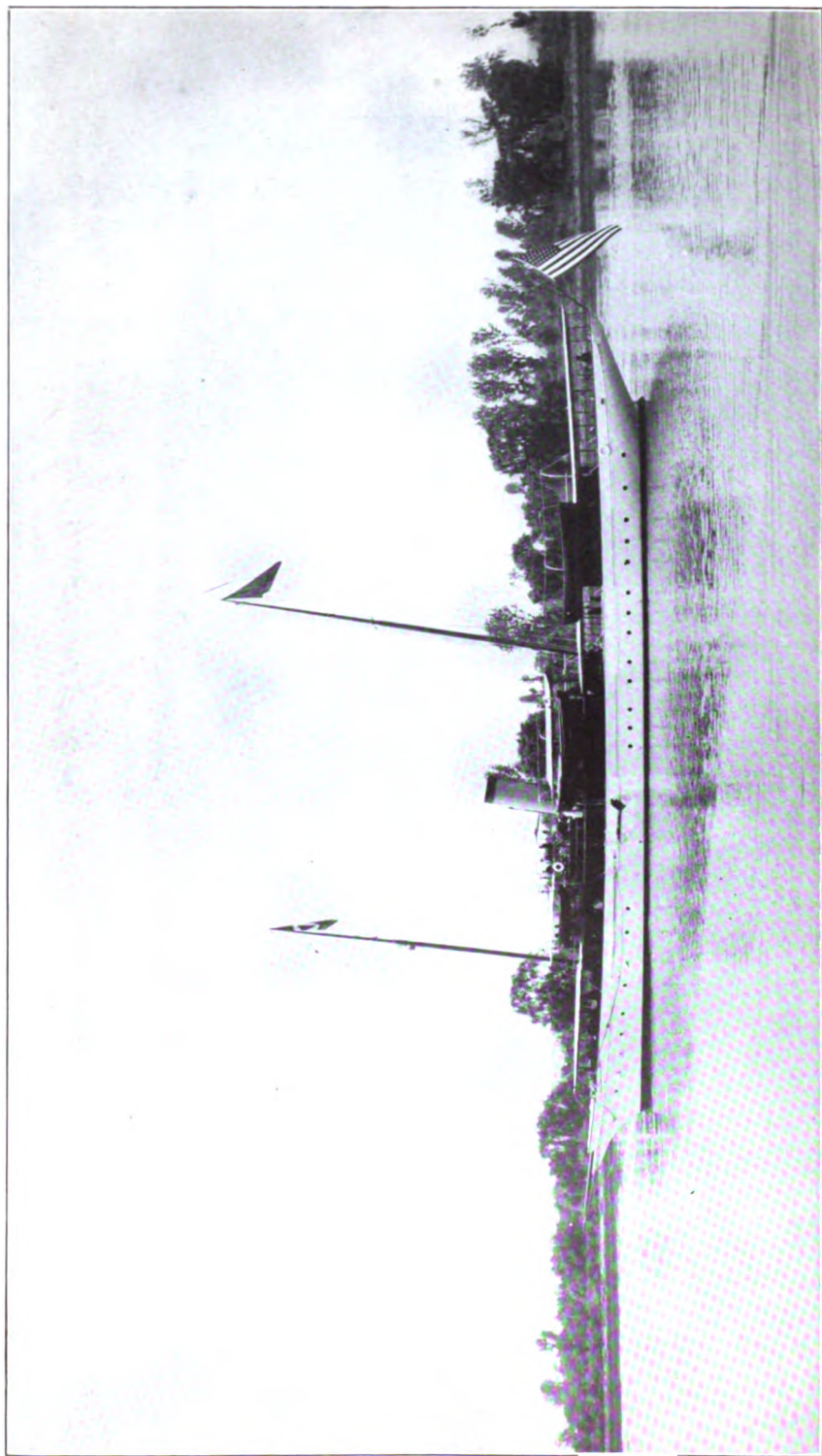


FIG. 11.—Coast and Geodetic Survey vessel "Isis."

Steel steam vessel of 377 gross tons and 256 net tons; registered length 180.4 feet, breadth 24.8 feet, draft 11.7 feet; indicated horsepower 2,000; speed 15 knots; coal capacity 120 tons; complement 8 officers and 44 men. Purchased July 1, 1915. Present duty, offshore hydrography on the South Atlantic coast of the United States. This vessel does five times the work of her predecessor ship.

The *Sawapov*, the most suitable vessel of her kind ever built for this Service, will be ready for the Alaska work next spring. Her keel was laid in the winter of 1915, and she was launched in July of this year.

In addition to the present work in Alaskan waters, the coasts of Washington, Oregon, and California are in urgent need of completed surveys and the protection which complete and accurate charts afford. It has been impossible heretofore to give these coasts the attention they require. It can not now be done for lack of ships.

On the Atlantic coast the new vessel *Isis* (see fig. 11) has done admirative work during the past season. She, the *Eschscholtz*, and the *Hydrographer* are all in good working condition and suited for the work they are called upon to do. The *Matchless*, an old sailing vessel, nearly 60 years old, is used as a house-boat for surveying parties in some of the inland waters. Extensive repairs on her are useless, as she will last but a short time longer.

It is earnestly hoped that sufficient funds will be appropriated to keep these vessels in service twelve months of the year, as their services are needed on survey work continuously.

Government-Owned Launches Needed.

An appropriation for the purchase of launches for wire-drag surveys and inshore work on the Atlantic and Pacific coasts is again urged. The wire-drag parties cost on an average \$3,173 per month, a large part of which is for the hire of launches. Launches suitable for these operations are scarce, and all that are available must be modified to meet the needs of the work. The launches most suitable are the highest priced. For example, the largest boat for each of the Alaska parties cost nearly \$1,000 each per month. A great deal of time is lost each year in selecting and remodeling the boats for this particular service. The superstructure has to be removed and at the end of the season put back in the shape it was found, and the Government has to pay for it. If, on account of bad weather, the launches have to be laid up, the cost of their hire still goes on, and, while the officers and men are not idle, the launches are making no returns.

If the appropriation is made for Government-owned launches, they can be built not only in the way best adapted for the work, but they can be used for wire-drag work as well as revision and inshore work. Considered from the standpoint of economy, it is certain that as much as 20 per cent would be saved on the investment.

Increase of Pay of Men on Vessels.

A serious matter with which the Bureau has had to contend is the general demand for increase of pay of the men employed on the vessels of the Survey. On July 1, 1916, increases were approved of \$8 per month for seamen and quartermasters and \$5 a month for other petty officers and men in Alaska in order to insure the retention of these employees.

In the estimates for 1918 for the Alaska vessels a further increase of \$3 per month per man is included for the lower-paid employees. Even then the rates proposed in the estimates for 1918 are about \$10 per month below the prevailing wages on the Pacific coast during the summer of 1916. On the Atlantic coast increases in pay are urgently needed, but the present appropriation will not permit it. In the estimates for 1918 increases of \$5 to \$10 per month are included.

The commanding officers of the vessels in the Service repeatedly urge the necessity for advancing wages if crews and officers are to be retained. They state frankly that it is impossible to get men for the wages heretofore paid. This agrees with the experience of the Department in its maritime services.

The officers of our vessels on the Atlantic coast report similar conditions, stating that it is only with extreme difficulty that they can keep crews when other services and merchant vessels are paying higher wages. One officer writes that every day some of his men ask discharges to accept better paying jobs elsewhere, and that to fill the places these men leave he can only get men that nobody else will use.

There is no service in the Government where trained seamen are more absolutely essential to the welfare of the work. An officer in this Service is a trained specialist, and the same term can be used in reference to a seaman who has had a term of service in this Bureau. The demands on him are much more exacting than under the regular routine on passenger steamers, and his duties are more varied and require thoughtfulness and skill. It can be readily understood that a man who has been trained by an officer of the Government until he reaches a high degree of efficiency should be retained from year to year. Conditions should be such that an employee who proves satisfactory can be given assurance that promotion will follow continued effort on his part. Under the present conditions an inexperienced man is hired in the spring, receives a partial training during the summer, and is dismissed in the fall

because the funds are insufficient to continue his employment from year to year. Were the funds sufficient, it would be perfectly feasible to keep these men busy throughout each year on work that is necessary to be done.

Need of 48 Additional Hydrographic and Geodetic Engineers.

The accompanying table shows the need of additional engineers to properly and efficiently officer the various parties of the Survey. Congress very wisely provided additional funds with which to pay party expenses, and if the Survey is to do the work asked of it in charting the waters of the country and providing geodetic control of the interior further funds must be available for party expenses in the coming year. This means that there must be provided the necessary hydrographic and geodetic engineers to direct this work.

Our engineers are not only the chiefs of party, but they also make the observations with sextant, theodolite, plane table, and level. The men, or nontechnical force, are there to assist the engineer by rowing the boat, running the launch, heaving the lead, etc.; they can not do the instrumental work. Without the engineers the Survey is in the same condition as a merchant vessel which has not sufficient officers for its proper navigation. The result of such a condition upon our work is evident. The officers become overworked, lose their ambition to do things in the most efficient manner, and at the end of the season look for more inviting fields of engineering; or they may accept the conditions imposed and drift along, thinking that if those higher in authority are not sufficiently impressed with the importance of providing means for securing a well-balanced party that can secure results at a minimum unit cost they (the officers) would be exerting futile efforts. We can not blame them.

There will be needed 22 additional officers in the spring of 1917 to carry on the work for which party expenses have been appropriated.

The *Surveyor* will need 11 officers; the *Yukon* will need 3 officers; the *Isis* will need 4 officers; the *Matchless* will need 2 officers; and the Pacific coast triangulation will need 2 officers; total needed, 22.

There are 48 additional officers asked for in my estimates for 1918. This will provide for the 22 now needed and for 26 who will be needed if the increases in the party expenses appropriations are allowed.

FIELD OFFICERS, COAST AND GEODETIC SURVEY—PERSONNEL OF PARTIES.

Assignment.	Summer of 1916.						Summer of 1917.	
	Asst.-ants.	Aids.	Mate.	Deck officers.	Total.		Total.	
					Parties.	Officers.	Parties.	Officers.
Office.....	15				10	15	10	15
Suboffices.....	5	1			4	6	4	5
Boat.....	2		2	4	1	8	1	7
Isle.....	3				1	3	1	7
Hydrographer.....	1	1		2	1	4	1	4
Matchless.....	1		1	2	1	4	1	6
Patterson.....	3	4	2	1	1	10	1	9
Explorer and Cosmos.....	3	2	1	1	1	7	1	7
Taku.....	1	2			1	3	1	3
Surveyor ^a							1	11
Yukon ^b							1	3
Wire drag No. 1.....	2	2	1	3	1	8	1	7
Wire drag No. 2.....	1	3	1	2	1	7	1	7
Wire drag No. 3.....	2	3		3	1	8	1	7
Wire drag No. 4.....	3	1	1	2	1	7	1	7
Wire drag No. 5.....							1	7
Wire drag No. 6.....							1	7
Pacific revision.....	3				2	3	3	6
Atlantic revision.....	3		1	1	3	5	4	6
Philippines.....	10	10	4		6	24	6	24
Inspecting new vessels.....	1				1	1	1	1
Coast Pilot.....	4				4	4	4	4
Tides and Currents.....	1				1	1	2	2
Triangulation.....	2				2	2	9	13
Levels.....	4				4	4	7	7
Gravity.....	2				2	2	2	2
Astronomical.....	3				3	3	3	3
Total.....	75	29	14	21	53	139	70	187

^a Building.^b Not in commission.

Increase in Salaries for Hydrographic and Geodetic Engineers.

The old theory about the civilian appointments in the Government was that any man was fortunate who retained his job, however small the pay, for more than four years. This was in the days before there were civil-service laws. Now the Government considers itself very fortunate if it can retain experts in its service at salaries much smaller than those ruling in similar work in private life.

The Government is the largest single employer of skilled service. It is also the most inefficient employer. It sees 15 per cent or more of its skilled employees leave each year. These are, as a general rule, the most able and efficient ones. The least able employees remain, and on account of long and faithful, but often not notably efficient, service, they reach the higher positions. Then we have too much deadwood at the top. How often do we

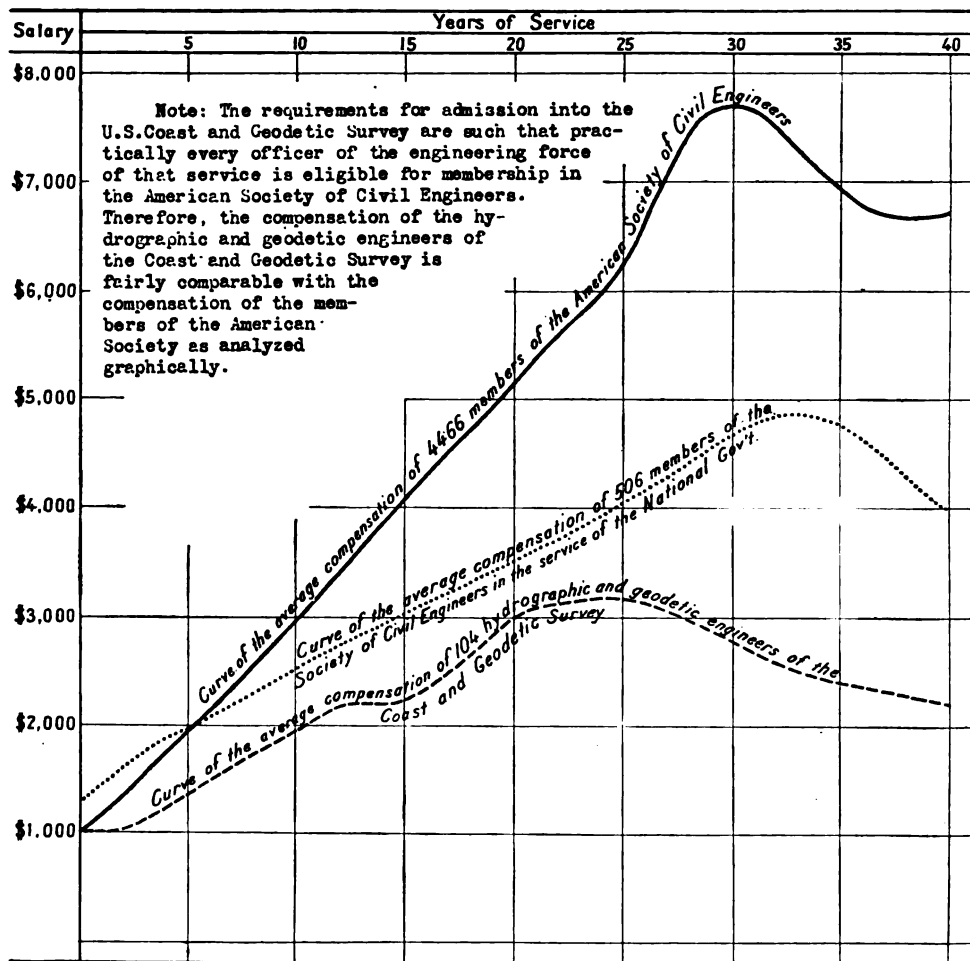


FIG. 12.—Comparative diagram of engineers' salaries.

Average compensation of hydrographic and geodetic engineers of the United States Coast and Geodetic Survey, compared with the average compensation of 4,466 members of the American Society of Civil Engineers, as analyzed in a report of a committee of that society, dated December, 1914.

hear that remark about a Government organization, especially an old one. We try to remedy this condition by having a surgical operation where a much milder treatment given at the right time would have prevented the trouble.

What is the condition to-day in the field force (assistants and aids) of the Survey?

There are 104 engineers in statutory and 14 in nonstatutory positions. Of the total of 118, there are 62, about 53 per cent, who have had less than $6\frac{1}{2}$ years of service. There are 43, or about 36 per cent, who have had less than $3\frac{1}{4}$ years of service. Aside from the inefficiency in costs involved in having inexperienced officers, are we not menacing vessels carrying millions of dollars worth of cargo, besides their own value, and thousands of the crews and passengers who run the gravest risks from having a number of inexperienced engineers and surveyors making the surveys upon which the sailing charts are based? We are; and this condition should be remedied. We can not make some of the work easy, nor can we always make the conditions pleasant under which the men have to live in the field, but we should make our engineers feel that we (that is, the Government) are fair.

What is necessary to make for greater efficiency in the force is to have salaries more nearly equal to those paid for similar or less exacting duties in other Government services and also in private engineering fields. The following tables show the salaries of the officers of the Survey in contrast with those of some other organizations and the relative increase of field officers and appropriations (see also fig. 12):

COMPARISON OF PAY OF HYDROGRAPHIC AND GEODETIC ENGINEERS WITH ANALOGOUS ENGINEERING AND GOVERNMENT ORGANIZATIONS.

Service.	Average pay.	Reference.
American Society of Civil Engineers.....	\$4,224	Report of committee of society, December, 1914.
41 civil engineers, United States Navy.....	3,429	1916 estimates, p. 1078.
226 engineers, United States Army.....	3,008	1916 estimates, p. 295.
62 Revenue-Cutter officers (retired list).....	2,921	1916 estimates, p. 1120.
249 Revenue-Cutter officers (active list).....	2,670	1916 estimates, p. 1120.
Geologists, Geological Survey (73 annual employees).....	2,130	1916 estimates, pp. 795-798.
Topographers, Geological Survey (57 annual employees).....	2,164	1916 estimates, p. 795.
Bureau of Mines (34 annual employees).....	2,662	1916 estimates, p. 806.
Patent Office (396 annual employees).....	2,019	1916 estimates, p. 95.
Hydrographic and geodetic engineers, Coast and Geodetic Survey (104 annual employees).	1,720	1917 sundry civil bill.
Hydrographic and geodetic engineers if granted increase requested (152 annual employees).	1,900	1918 estimates.

NOTE.—Wherever information is available in regard to those who resigned from the field force, in general the salary received in the new position is higher than that received in the Coast and Geodetic Survey.

Salary	
\$6000	
	Note
	U.S. Govt. at
	San Diego
\$7000	at 10%
	to 1000
	Proportionately
	and 10%
	to 10%
\$8000	fairly
	at 10%
	to 1000
	Proportionately
	and 10%
\$9000	
\$10000	
\$11000	
\$12000	
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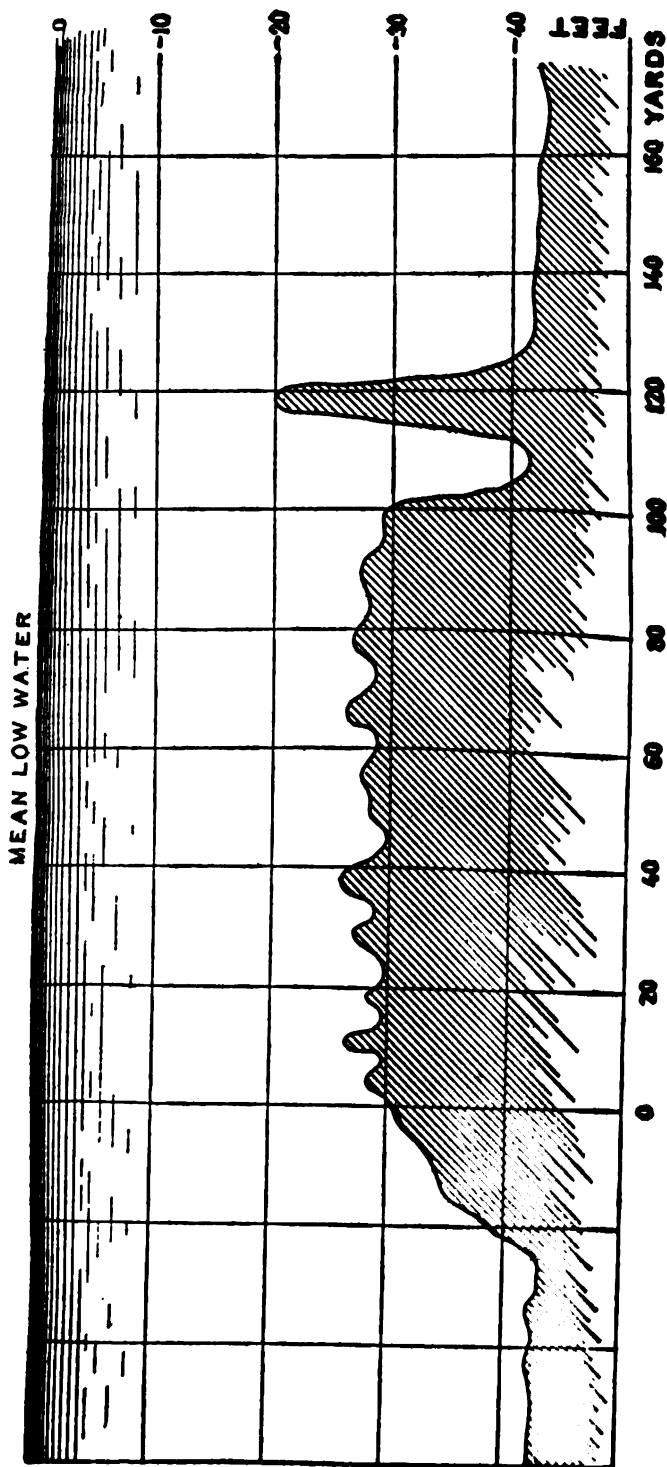


FIG. 13.—One result of wire-drag work in 1916.

This pinnacle reef recently found at the approach to Salem Harbor, Mass., is no less dangerous than submerged pinnacles abounding in Alaskan waters.

The General Board of the Navy has also given consideration to the use of wire-drag surveys as a part of the national defense, and the Bureau has cooperated with them in planning this work to meet their most urgent needs. A careful study of the subject was made, and the estimates submitted to Congress for the fiscal year 1918 have been prepared to carry, also, surveys of two localities requested by the Navy and which it would not be possible for the Survey to do with its present appropriations.

Another striking development this season is the use of a drag 15,000 feet long in open areas. It is hoped to increase this length for ordinary use in open areas as soon as larger reels to hold the necessary length of wire are available. The delivery of the reels has been delayed on account of the congested condition of the market for all steel products.

The numerous submerged pinnacles found in Alaskan waters and on the New England coast during 1916 clearly demonstrate again the urgent need of expediting this important work in vast areas known to be dangerous to human life and commerce. There is also wire-drag work urgently needed among the coral reefs of southern Florida, Puget Sound, and San Francisco Harbor, which is only waiting for the necessary funds.

Geodetic Work.

In my report for 1915 it was shown that the National Government should do the geodetic work of the United States which furnishes the fundamental control in elevation and geographic position for the surveying and mapping and the various engineering operations of the country.

This work consists in the precise leveling which, starting at the coasts, extends inland along the principal lines of communication and forms a network of lines of bench marks of a permanent nature, which may be used as bases from which leveling of equal or lower accuracy may at any time in the future be extended for the detailed surveying and engineering work; also in primary triangulation which will cover the country with connecting arcs of stations all substantially monumented. The standard or final latitude and longitude of each station are determined and published for the control in horizontal positions of maps and surveys.

This country has an area of about 3,000,000 square miles, and the extension of the fundamental control has been necessarily slow on account of the cost involved. But to-day this work is done for less than one-half what it cost 20 years ago, and as the

demands for the results are far greater than hitherto it appears to be good management, on account of the necessity for the results and the economy with which it is done, to push to a rapid completion that part of the work which is essential in the proper development of the country.

The plan that should be carried out during the next few years is to have such an amount of primary control that no place in the United States would be more than about 100 miles from a precise-leveling bench mark or a primary triangulation station.

The appeal to Congress during the past session for funds to extend the geodetic work of the Survey was met by an increase of 70 per cent. This is a good start, but considering the fact that the previous appropriation was only \$31,000 it will be seen that further increases should be made, as the estimated cost of completing the work which is badly needed now is more than \$1,000,000. If no further increase is made, this work will require from 15 to 20 years. It should be done in one-half that time.

What has been said as to the need for geodetic control in the United States applies equally to the interior of Alaska. There is no control, except along the Alaska and Canada boundary and along a portion of the coast, for an area of over one-half million square miles of territory, which is becoming more and more necessary for the operations of several Federal organizations as well as for private individuals and corporations. The country can not be properly developed without maps and surveys, which in the interior are being made by the United States Geological Survey, the General Land Office, the Forest Service, and the Alaskan Engineering Commission. Requests for geodetic data in the interior of Alaska have been made upon the Coast and Geodetic Survey by officials of those organizations, and I strongly recommend that funds be provided for starting this important work.

The precise leveling and primary triangulation which should be done in the interior of Alaska are indicated on the accompanying diagrams (see figs. 14 and 15) and in the following statement.

In my report for the previous year there was shown the importance of having certain primary triangulation on the Pacific coast of the United States and Alaska and supplementary triangulation on the Atlantic and Gulf coasts. The increased funds provided by Congress made it possible to do something on these lines of work.

PRIMARY TRIANGULATION NEEDED IN ALASKA.

	Miles.
Norton Sound to Eagle, via Yukon River.....	750
Yukon River to Kuskokwim Bay.....	350
Upper part of Kuskokwim River.....	250
Across Alaskan Peninsula, Cook Inlet to Bristol Bay.....	120
Susitna River, Cook Inlet to Fairbanks.....	300
Cordova to Tanana, along Copper and Tanana Rivers.....	700
From Copper River to One hundred and forty-first meridian.....	100
Total.....	2,570

PRECISE LEVELING NEEDED IN ALASKA.

Norton Sound to Eagle, via Yukon River.....	800
Yukon River to Kuskokwim Bay.....	400
Upper part of Kuskokwim River.....	300
Susitna River, Cook Inlet to Fairbanks.....	325
Cordova to Tanana, along the Copper and Tanana Rivers.....	750
Copper River to One hundred and forty-first meridian.....	110
Total.....	2,685

I can not leave this subject of geodetic work without calling attention to the assistance needed at the office to make the results of the field work available for the Government and for the public.

For many years the primary triangulation in the interior and the tertiary triangulation on the coast existed as a number of detached schemes, each based upon a separate astronomic determination (datum) for the latitudes and longitudes of the stations. Eventually, in 1901, the systems were sufficiently connected to justify the adoption of a single datum for the whole country. This was necessary for the proper utilization of the results. The adoption of the single datum for the whole country has been highly commended by geodesists of Europe, where, in general, each country has its own datum, with consequent confusion in the maps along the frontiers.

But the adoption of the single datum involved the Survey in much work, for practically all of the triangulation done previously needed recomputing. But new geodetic work has been turned in, in increasing amounts, by the vessels and land parties, due to larger appropriations for field work, so that, at present, there are thousands of triangulation stations for which the standard or final positions are not available in the proper form for use by the Government and the public. There has not been a proportionate increase in the computing force, which is now just about able to compute and have published each year data for as many stations as are established in a year, but which is not able to handle the older but very valuable work. Without

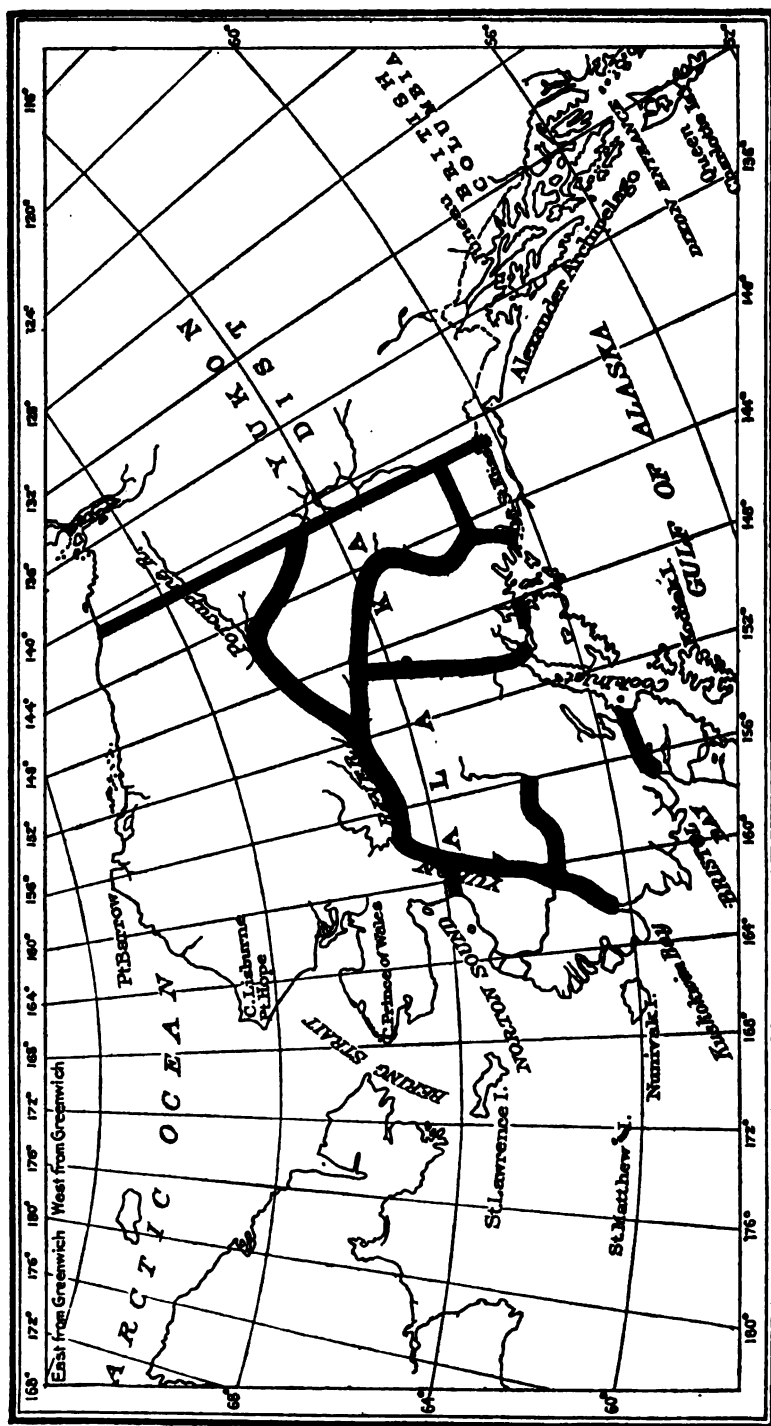


FIG. 14.—Primary and secondary triangulation needed in Alaska now.
(Work along 141st meridian has been done by Boundary Commission.)

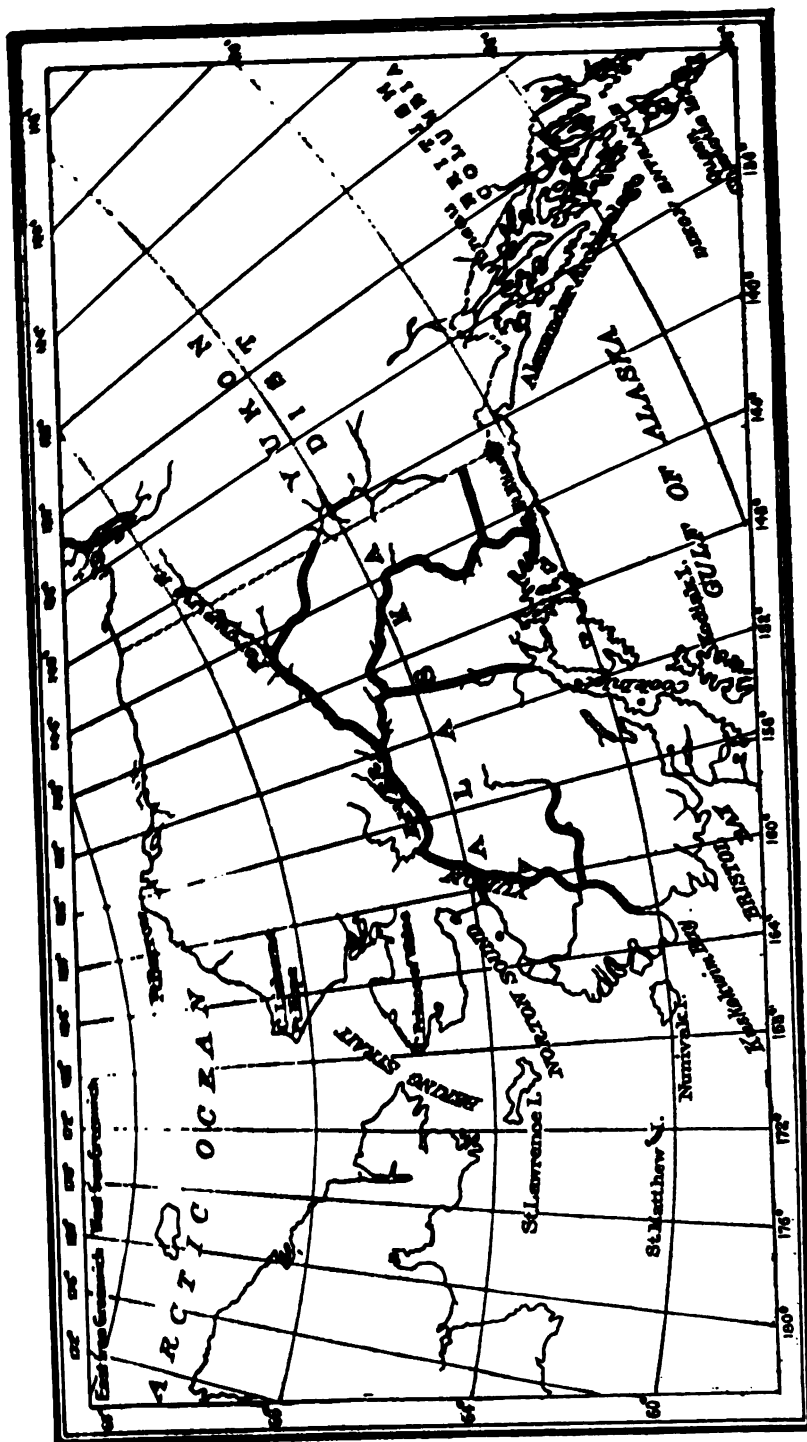


FIG. 15.—Precise leveling needed in Alaska now.

an increase in the force of computers much geodetic data must remain in the archives and be practically unavailable for use.

The establishment of a triangulation station in the field costs, on an average, about \$60, while the cost of computing the observations and preparing the results for printing is only about \$7 per station. It will be good business to make this additional expenditure, in the form of an increased appropriation for additional geodetic computers. Not to do so would be as inefficient as for the officials of a factory not to provide for sufficient force for the packing and sale of its products.

Magnetic Observatories.

Most of the leading nations of the world are cooperating in a study of the earth's magnetism in an effort to determine its origin, the causes of its many fluctuations, and the laws which govern them. In view of the dependence of navigators and land surveyors upon the compass needle, of which the directive force is the earth's magnetism, the practical importance of this study can not be questioned.

In order that accurate data may be available for these investigations, many magnetic observatories are in operation at which continuous records are made of the changes in direction and intensity of the earth's magnetic force. As the changes are found to be different in different parts of the earth, it is important to have the observatories as widely distributed as possible. The United States, by reason of its large extent of territory, is called upon to take a large share of this work, and magnetic observatories are now being operated by the Coast and Geodetic Survey at Cheltenham, Md.; Tucson, Ariz.; Vieques, P. R.; Honolulu, Hawaii; and Sitka, Alaska.

In his address at the celebration of the centennial of the Coast and Geodetic Survey, Dr. L. A. Bauer, Director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, urged the establishment by the Coast and Geodetic Survey of magnetic observatories in the Canal Zone and at Guam. The desirability of a magnetic observatory in the Canal Zone had already been recognized by the Coast and Geodetic Survey, and in view of the proposed rehabilitation of the Jesuit observatory near Manila under the auspices of the Carnegie Institution, it is felt that there is greater need for one there than at Guam. It is proposed, therefore, as soon as conditions are favorable and the

necessary funds can be secured, to establish a magnetic observatory in the Canal Zone.

To insure freedom from the disturbing effect of electric car lines and similar causes it is necessary to place a magnetic observatory at least 10 to 15 miles from such installations. From this it follows that it is usually necessary to provide quarters for the observer and means of transportation for supplies from the nearest supply point.

When the building now in process of construction at the Sitka observatory is completed, there will be observer's quarters at each of the five observatories except Cheltenham. Up to the present time it has been possible for the observer in charge of that observatory to rent suitable quarters. The character of the observatory work is such that it is important to have the observer in charge live so near that he can readily make an inspection of the buildings and instruments at any time of the day or night. At the present time there are only two rented houses at Cheltenham, and they are about a mile from the observatory. Conditions might easily arise which would compel the observer to go still farther away for suitable quarters. The present combination of office and observatory in one building is also unsatisfactory, because of the danger that necessary articles of office equipment may have a disturbing effect on the instruments. Provision therefore has been made in the estimate for 1918 for a building for office and quarters at Cheltenham.

A material reduction in the cost of operation of the Tucson and Honolulu observatories is expected from the substitution of motor-driven for horse-drawn vehicles. A small truck has been purchased for Tucson, and while the first cost is about \$250 greater than for a horse and wagon it is estimated that there will be a saving of about \$75 a year in the cost of operation (including depreciation), and there will also be a material saving of time on the road and in the care of the horse.

A similar change is being made for Honolulu. The needs of the observatory will thus be better served.

Retirement.

The serious question of retirement for civil-service employees, while probably affecting more or less all the bureaus of the Government, is so specially evident in the Coast and Geodetic Survey that some specific retirement provision should be made for its engineers. The Bureau is somewhat handicapped to-day on account of the

fact that a number of these highly trained men, who have served the country faithfully for nearly 50 years and have had largely the same education as the graduates of Annapolis and West Point, have now reached the age where the duties they once performed are too irksome for their advanced years. It necessarily results in a hardship for them to undertake to perform such arduous tasks.

The small salaries these hydrographic and geodetic engineers, who are also navigators, have received during their tenure of office have not been adequate for them to save any considerable amount of money. The result is that in their advancing years they are forced to attempt to continue at their duties, when at the age of 64 they should be allowed to retire at a substantial pension, the same as an Army, Navy, Public Health Service, or Coast Guard officer. It is not justice, under prevailing conditions, to ask that these men retire from the service. At the same time, frankly speaking, the service is handicapped, inasmuch as their places should naturally be filled by younger men who are better able to meet the hardships.

To-day in the Coast and Geodetic Survey there are 15 or more men who have passed the retirement age, and they should be properly cared for by the Government to which they have devoted their lives. No one except those in touch with the situation can realize what their services have meant to this part of the Government work. While I have particularly dwelt on the question of retirement for hydrographic and geodetic engineers here, other aged employees of the Bureau are deserving of recognition under retirement legislation, but along different lines.

Purchase of Dutch Harbor, Alaska, as a Government Base.

Further attention is called to the desirability of the purchase of Dutch Harbor, Aleutian Islands, Alaska, as a Federal Government base. It is a matter that has been advocated by the heads of other services of the Government, and the value to the Government of this location in far western Alaska can not be overestimated at this time. Further, it can be said that it would be a better investment to the Government than it was a year ago, on account of the increased activities in Alaska and its waters and the need of a permanent coal, oil, and supply base on the Bering Sea.

General Summary of Operations—Vessels and Parties.

Atlantic coast.—The steamer *Bache* was employed on hydrography extending out to the 100-fathom curve on a part of the coast of New Jersey; off the entrance to Chesapeake Bay, Va.;

and on the coast of Georgia between Brunswick and Savannah. Revision work was done in Norfolk Harbor and Hampton Roads.

The steamer *H. Dragrober* was employed on hydrography in New York entrance in the vicinity of Sandy Hook; current observations at the eastern end of Long Island Sound; hydrography on the north side of Block Island, including Great Salt Pond; examination for a reported shoal in Gardiners Bay, N. Y.; surveys of Assateague Anchorage, Va., and Port Royal Sound, S. C.

The steamer *Isis* was purchased on July 1, 1915, and was employed chiefly on hydrography extending out to the 100-fathom curve on the coast of New Jersey off the entrance to Chesapeake Bay, and on the coast of South Carolina.

The schooner *Matchless* completed the resurvey of Roanoke and Croatan Sounds, N. C.; of Pasquotank River from Albemarle Sound to a point 2 miles above Elizabeth City; and of the easterly side of Pamlico Sound from the north end of Core Sound to Curacoeka Inlet.

Wire drag work in the approaches to Boston Harbor, Mass., was completed by wire-drag party No. 1 from Minots Ledge to Nahant; in Quicks Hole and the nearby part of Buzzards Bay, Mass.; in the eastern passage of Narragansett Bay in the vicinity of Newport, R. I.; and in the approaches to Salem, Mass. Chart-revision work was done in Narragansett Bay.

Wire drag party No. 2 continued the survey of the coast of Massachusetts between Boston and the Cape Cod Canal; completed the stretch from Minots Ledge to Plymouth; and began a survey of East River, N. Y., completing the examination of the main channel from Lawrence Point to College Point. Chart-revision work was done in East River and Newark Bay, and hydrographic examinations were made in the vicinity of Bergen Point, N. J., and Pollock Rip Shue, Mass. A topographic and hydrographic survey of Plymouth Harbor, Mass., was begun.

Revision work for the location of prominent natural objects on the charts and building and location of hydrographic signals were done on the coast of New Jersey, at the entrance to Chesapeake Bay, and on the coasts of South Carolina and Georgia between Charleston and Brunswick.

Field verification was made of coast-pilot information along the coast from Sandy Hook to Cape Henry, including Delaware and Chesapeake Bays, and between New York and Key West.

Suboffices of the Survey were maintained at Boston, New York, and Galveston, Tex.

The offices at New York and Galveston are under the charge of officers of the Survey, and that at Boston is under the charge of a representative of the Bureau of Foreign and Domestic Commerce. At these offices a stock of charts and publications of the Survey is kept on hand.

At the request of the Navy Department a verification was made and the beacons renewed on the torpedo-boat trial course at Provincetown, Mass.

Field work, Pacific coast.—The steamer *Explorer* was employed on combined surveys at the entrance to Cook Inlet, Alaska. A resurvey was made at Port Gamble, Wash.

The steamer *Gedney* made a complete survey of Bucarell Bay, Port Real Marina, and Portillo Channel, from the limits of previous surveys to the seaward entrance between Capen Bartolome and Felix, southeast Alaska. This vessel was afterwards condemned and sold.

The steamer *McArthur* was engaged on combined surveys of Sealed Passage, Felice Strait, and the northerly part of Revillagigedo Channel. This vessel was afterwards condemned and sold.

The steamer *Patterson* was employed on general surveys in the Shumagin Islands, Alaska Peninsula. Parts of Nagai and Big Koniugi Islands and all of Spectacle, Bendel, and Turner Islands were surveyed. Examinations were made of the area about Tuna-rora Rock, Unalaska Bay, and in the vicinity of Harvester Island, Uyak Bay.

During the season of 1916 this vessel was employed in surveys of the passages in southeast Alaska leading southward from Sumner Strait, between Kashevarof Passage and Eastern Passage, including Ernest Sound and Bradfield Canal.

The steamer *Taku* completed the survey of Port Gravina, the coast from Knowles Head to Red Head, and Fidalgo Bay, Prince William Sound, Alaska. In the spring of 1916 this party took up the survey of Orca Inlet and the delta from Point Whitshed to Point Martin. A subparty began a survey of the military reservation at Orca Inlet.

The steamer *Yukon* continued the survey of the Kuskokwim River, and an officer of this vessel made a running survey of the river above Bethel on a river steamer. The *Yukon* was not put in commission in 1916 owing to a shortage in funds.

Wire-drag party No. 3 completed the dragging of channel areas, with depths less than 50 fathoms, in Revillagigedo Channel from Twin Islands southward to the Canadian boundary, and the

topography from the entrance of Boca de Quadra to Foggy Point, including Very Inlet. In Clarence Strait the main channel was dragged from Caamano Point to Lemesurier Point and some triangulation was done. Work was continued during the season of 1916 in the passages between Clarence Strait and Eastern Passage extending southward from Sumner Strait to and including Ernest Sound.

Wire-drag party No. 4 completed the dragging of the main channel of Sumner Strait, from Shakan Bay around Point Baker to Zarembo Island, during the season of 1915, and in the following season undertook the completion of the entire channel of Sumner Strait from Wrangell to the sea, including the entrance northward of Coronation Island and the passages extending southward from Sumner Strait to a junction with the work of wire-drag party No. 3.

A hydrographic examination was made of the bar between Middle and Stake Points, Suisun Bay, Cal.

An examination was made in the vicinity of Cape Flattery to locate a reported rock and to develop Neah Bay and the broken ground near Duncan Rock.

A field revision of the Coast Pilot of California, Oregon, and Washington was begun and also of the Coast Pilot of Southeastern Alaska.

Suboffices of the Survey were maintained at Seattle, Wash., and San Francisco, Cal.

Philippine Islands.—The field work in the Philippine Islands is under the immediate direction of the director of coast surveys, an officer of the Coast and Geodetic Survey, who, acting under authority of the Superintendent, makes plans for the work, issues detailed instructions to the field parties, and has charge of the suboffice at Manila.

The steamer *Pathfinder* was employed on hydrographic surveys in the easterly approach to San Bernardino Strait and combined surveys at the entrance of Manila Bay. Lines of soundings were run across the Sulu Sea to develop a safe route for vessels through Balabac Strait northward of Borneo. Combined surveys were begun at the south end of Palawan Island.

The steamer *Fathomer* was employed on hydrographic surveys in the north end of the Sulu Sea in the vicinity of the Cuyo Group. Combined surveys were made in Green Island Bay, east coast of Palawan. Afterwards the triangulation of the east coast of Mindanao was begun.

The steamer *Romblon* was employed on combined surveys at the north end of Palawan Island and in the Cabuluan Islands.

The steamer *Marinduque* was employed on combined surveys on the east coast of Coron and Busuanga and the western approaches to Coron Bay and afterwards on the east coast of Palawan. A triangulation station was established on Mayon Volcano, southern Luzon, and connected with the scheme of triangulation connecting Sorsogon and Lagonoy Bay.

Assistance Rendered in Saving Life or Property.

On June 19, 1916, the steamer *Pathfinder*, in response to a call by wireless, went to the assistance of the steamer *Fernando Poo*, which had stranded on a reef near Black Rock Light in the Sulu Sea, Philippine Islands.

The passengers and crew, with the baggage and mails and a quantity of provisions from the stranded vessel, were taken to Iloilo by the *Pathfinder* after several unsuccessful attempts to tow the *Fernando Poo* off the reef had been made. The vessel afterwards sank.

Minor assistance was rendered to several vessels by the steamer *Isis* while employed in offshore work on the south Atlantic coast. Among these were the four-masted schooner *Augustus Welt*, bound to Stamford, Conn., from Buenos Aires, the United States Engineers' dredge *Barnard*, and the launch *North Star*.

The steamer *Bache* rendered minor assistance to the barkentine *Argo*, of Nostral, Denmark, bound for Satilla River, Ga.; the steamship *Rio Grande*, bound for Savannah; the Finnish bark *Vega*, bound for Sapelo River; and the topsail schooner *Jarstein*, bound for the same place.

New Vessels for the Survey.

An appropriation of \$289,000 became available July 1, 1915, for two new vessels for the Survey, to replace the *Endeavor* and the *McArthur*, which had become unfit for further use.

The *Endeavor* had been condemned and sold in May, 1915. The *McArthur* and *Gedney* were sold at Seattle in 1916.

The steamer *Isis* was purchased for the use of the Survey July 1, 1915.

Plans were made and a contract awarded to the Manitowoc Ship Building and Dry Dock Co., of Manitowoc, Wis., for the construction of a new steel steamer for the Survey to be called the *Surveyor*, and the construction was begun. On June 30, 1916, the construction of this vessel was reported as 55 per cent completed.

The *Surveyor* is a steel steam vessel of 1,000 tons displacement, 186 feet in length, 34 feet beam, and 12 feet draft. She will have one triple-expansion engine of 1,000 horsepower and is expected to have a speed of 12 knots. Her engines and boilers will be of the latest and most approved type, and the boilers will be fitted to burn fuel oil.

The *Surveyor* will carry the usual equipment of a surveying vessel, including machines for sounding at all depths. She will be fitted with a radio apparatus of a new type.

Coast Pilot Work.

The collection of information in the field for the compilation of new editions of the Coast Pilot volumes has been continued, and the office compilation and publication of these volumes have made good progress.

A new Coast Pilot volume for Alaska was published, two new editions of Coast Pilot volumes for the Atlantic coast were prepared, and eight Coast Pilot Supplements were prepared and published.

Tidal and Current Work.

Tidal observations were made in connection with hydrographic surveys in the United States, Alaska, and the Philippine Islands and at seven regular stations on the Atlantic coast, three in the Gulf of Mexico, and three on the Pacific coast.

Tidal indicators, exhibiting automatically the stage and height of the tide, were maintained at Fort Hamilton and New York, N. Y., and at Reedy Island, Delaware River.

With the cooperation of the Bureau of Lighthouses, observations of currents were made at five light vessels on the Atlantic coast, two on the Gulf of Mexico, and five on the Pacific coast. Current observations were also made by field parties engaged on hydrographic work.

Two special publications relating to tidal currents on the Atlantic and Pacific coasts were prepared and published. Special tide tables for the Kuskokwim River, Alaska, were prepared and published.

The general tide tables for 1917 were prepared and sent to the printer. These tables have been greatly enlarged and simplified and much information in regard to the currents has been added.

Tidal information was prepared for use in the Coast Pilots and for publication in the newspapers.

An effort has been made to greatly improve the tidal bench marks established by this Service, and a circular on the subject has been issued.

Geodetic Work.

A reconnoissance for primary triangulation from southern Utah westward along the Oregon Short Line Railroad through Oregon was completed and a connection made with stations of the California-Washington arc in the vicinity of Portland, Oreg.

Observations at the primary triangulation stations in northern Utah were continued. The work follows the Oregon Short Line Railroad to its crossing of the Columbia River in northeastern Oregon. The arc then extends westward down the river to a junction with the Washington-Oregon arc of triangulation in the vicinity of Portland, Oreg. A base line was measured at Stanfield, Oreg., in the spring of 1916, and at the close of the fiscal year observations were in progress at triangulation stations in the vicinity of, and to the eastward of, Portland, Oreg.

The use of motor trucks on these pieces of work proved to be very efficient in reducing the time of travel between stations, which were in some cases 100 miles apart. Such a distance could usually be made in one day by the truck, while the older method of traveling by freight teams would have required at least four days.

The use of the motor trucks on the triangulation and the reconnoissance (selection of the stations) is an innovation in this country which was inaugurated the last part of the previous fiscal year.

The primary traverse line between Memphis, Tenn., and Little Rock, Ark., was measured with invar base tapes. Angles were measured with the same accuracy as in primary triangulation at the turning points of this traverse. A primary base line was measured in the vicinity of Argenta, Ark., near the end of the traverse line, from which a primary triangulation will extend westward.

A reconnoissance for primary triangulation was extended from the vicinity of Pecos, Tex., northward through New Mexico and into Colorado, connecting stations of the Texas-California arc with stations of the transcontinental arc.

A portion of the old traverse line extending from Port Isabel to Brownsville, Tex., was rerun.

A secondary triangulation was executed on the Patapsco River and in Baltimore Harbor in compliance with a request of the United States district engineer officer at Baltimore.

In cooperation with the Chief of the Geodetic Section in Mexico a connection was made across the Rio Grande of the triangulation systems of the United States and Mexico.

Determinations were made of the geographic positions of prominent natural objects on the coast of California for use by the Lighthouse Service in locating aids to navigation.

The line of precise levels between Reno and Las Vegas, Nev., begun during the previous year, primarily at the request of the United States Geological Survey, was completed. This was needed to coordinate lines of levels which had been run by that survey in the southern part of Nevada. A spur line was run into southern California to the town of Laws.

A line of precise levels was run across the State of Florida connecting the permanent tide gauges at Cedar Keys, St. Augustine, and Fernandina, with the object of determining whether there is any relative difference in elevation between the mean sea level of the Atlantic and that of the Gulf of Mexico. The final computations have not been made, but the preliminary results of this work indicate that the difference is very slight, with the Gulf the higher.

Another line of levels was extended from the vicinity of Huntley, Mont., northeastward through Glendive to Snowden, on the Great Northern Railway, where connection was made with previous work.

Lines of precise leveling were begun in the States of Indiana and Michigan which had been requested by the United States Geological Survey. At the end of the fiscal year levels had been completed between Terre Haute and Lawrenceburg and progress made on the line running to the northward of Indianapolis.

Work was begun on a line of precise levels in Maine to extend across the State from Boundary to Vanceboro. This line will furnish much needed fundamental elevations in the interior of the State and will form a connecting link in the precise leveling net of Canada. The Geodetic Survey of Canada and the United States Coast and Geodetic Survey are cooperating in their geodetic work to the extent that the leveling and triangulation nets of the two countries will supplement and strengthen each other.

The efficiency of a precise-leveling party was increased by having the observations recorded on a listing adding machine, which was taken to the field and mounted on one of the small motor cars used in transporting the party during the observing as well as to and from their headquarters, also by having the tripod and level mounted on the second car. The machine and instrument remained on the cars throughout the day, even when the track was cleared for trains.

These improvements were made during the year, and so far as known were never employed in any country before.

Gravity stations were established in Michigan, Minnesota, North and South Dakota, Montana, Wyoming, Nebraska, Virginia, Delaware, Maryland, and Pennsylvania for the purpose of extending the investigations of the variations in the densities of the materials in the outer portion of the earth.

A determination was made of the difference of longitude between the observatory of the Coast and Geodetic Survey Office in Washington and the observatory of the Bausch & Lomb Optical Co., in Rochester, N. Y. An astronomic latitude was also observed at Rochester.

The astronomic latitudes of two monuments on the Tennessee-Kentucky boundary between the town of Hickman, Ky., and Union City, Tenn., were determined, at the request of the local authorities, in order to settle the question of the location of a portion of the boundary between the two States.

The computation, adjustment, discussion, and preparation for publication of the results of the work of triangulation, leveling, gravity, and latitude and longitude determinations were carried on throughout the year.

The demands for the results of the geodetic work are increasing from year to year. The calls for such data come from Government, State, municipal, and private engineers and surveyors. The geodetic data are used for the fundamental control of the elevations and geographic positions of their work.

Magnetic Work.

In the continuation of the magnetic survey of the United States, observations for the determination of the three magnetic elements were made at 427 stations, of which 250 were new primary stations, 87 were auxiliary stations for the investigation of regions of local disturbance, and 59 were repeat stations.

At the request of local authorities meridian lines were established at 20 places in connection with the magnetic work.

The magnetic survey of the 49th parallel boundary between the United States and Canada, of which the part west of the Rocky Mountains was done in 1905, was nearly completed by the close of the fiscal year.

Magnetic observations have now been made at all but 240 of the county seats in the United States.

Magnetic observations in Alaska and the Philippine Islands were confined to those which could be made in connection with other surveying operations.

The magnetic observatories at Cheltenham, Md.; Vieques, P. R.; Tucson, Ariz.; Sitka, Alaska; and near Honolulu, Hawaii, were in operation throughout the year.

Menaces to Navigation Discovered During the Year.

The following dangers to navigation were discovered, investigated, or reported by vessels or parties of the Survey during the year:

Massachusetts.—Shoals and rocks located with wire drag in approaches to Boston; shoals and depths less than charted found with wire drag off Plymouth; shoals and rocks off Scituate discovered with wire drag; shoal of small extent and several pinnacle rocks at entrance to harbor of Salem discovered with wire drag; shoals off Minots Ledge and in Broad Sound discovered with wire drag; rocks between Bartlett Rock and Howland Ledge discovered with wire drag; shoals off Brant Rock discovered with wire drag; shoals discovered with wire drag in vicinity of Marblehead Neck; dangerous rock with 19 feet of water near sailing course into Quicks Hole, with depths of 19 and 20 feet and depth of 13 feet south of Gull Island.

Rhode Island.—Shoal awash off Newport, discovered by wire drag.

New York.—Rocks at City Island, New York Harbor, located with wire drag; shoals and pinnacle rocks in East River located with wire drag; obstruction in Newtown Creek struck by tug *Alfred J. Murray*, reported by New York suboffice.

New Jersey.—Shoal with 5 fathoms of water 25 miles south by east of Barnegat reported.

Virginia.—Shoal with 22½ feet of water in approaches to Chesapeake Bay discovered and located.

North Carolina.—Obstruction on Middle Ground southeastward from Roanoke Marshes Light, with depth of 6 feet, and two other shoals located.

South Carolina.—Shoal with 27 feet of water between Martins Industry Light Vessel and Charleston Light Vessel discovered and developed.

Texas.—Shoals in Gulf of Mexico reported by suboffice at Galveston.

California.—Shoal with $5\frac{1}{2}$ fathoms of water near Sears Rock and Centissima Rock in Bonita Channel, entrance to San Francisco Bay, reported by San Francisco suboffice.

Alaska.—Three uncharted rocks in Revillagigedo Channel discovered with wire drag; rock with 12 feet off Point Stanhope discovered with wire drag; submerged rock in entrance to Shakan Bay with depth of 23 feet discovered with wire drag; rock in Clarence Strait struck by steamship *Mariposa*, position determined with wire drag; uncharted rock with 6 feet of water discovered with wire drag off Point Stanhope; five shoals located with wire drag in southern and eastern parts of Sumner Strait; 18-foot rock located with wire drag in entrance to Union Bay, Ernest Sound; four uncharted rocks in Sealed Passage and Felice Strait discovered and developed; reef 2 miles southeast of Aiaktalik Island marked by kelp, struck by steamer *Pavlof*, reported; rock near midchannel in Grindall Passage located; a number of uncharted dangers discovered and located in Kashevarof Passage, Clarence Strait; uncharted rock with 1 foot of water east of Fire Island, Kashevarof Passage, Clarence Strait, discovered and reported; three rocks near Wedge Islands, Clarence Strait, and one rock off Point Halliday, Movia Sound, located; four rocks located in channel southward of Tongass Island, Dixon Entrance; rock in Wrangell Strait, struck by steamer *Alki*, reported.

Philippine Islands.—Shoal in Iloilo Strait, Panay, reported by director of coast surveys, Philippine Islands.

STEAMBOAT-INSPECTION SERVICE.

Personnel.

The force of the Steamboat-Inspection Service at the close of the fiscal year was as follows:

At Washington, D. C.

Supervising Inspector General.....	1	
Chief clerk (who is Acting Supervising Inspector General in the absence of that officer).....	1	
Clerks.....	7	
Messenger.....	1	
		10

In the Service at large:

Supervising inspectors.....	10	
Traveling inspector.....	1	
Local inspectors of hulls.....	47	
Local inspectors of boilers.....	47	
Assistant inspectors of hulls.....	43	
Assistant inspectors of boilers.....	43	
Clerks to boards of local inspectors.....	69	
		260
Total.....		270

Three permanent positions (two assistant inspectors of hulls and one assistant inspector of boilers at New York) were added to the Service during the fiscal year. Congress provided for the current fiscal year 30 additional assistant inspectors, 1 additional traveling inspector, and 1 clerk, making the present total field force 291 persons and an aggregate force of 302 in the entire Service. This addition was essential to doing the work of the Service properly, but the demands upon the force have so largely increased that even the increased staff is now insufficient and a further increase is imperatively required. The weakest spot in the Service is in the clerical staff. It is obvious that an increase of 31 inspectors will mean additional pressure upon a clerical force already insufficient and overworked. The urgent need, therefore, for an increase in the clerical force of not less than 12 will be brought before Congress at its next session. It has repeatedly been necessary to detail to the Office of the Supervising Inspector General clerks from other bureaus and offices in order to keep up with the current work. This means merely the taking from forces already pressed to add to one that is overworked. It is robbing Peter to pay Paul.

Summary of Activities.

The force inspected and certificated 7,349 vessels in the fiscal year 1916, issued licenses to 18,102 officers of all grades, inspected at the mills 4,553 steel plates for the construction of marine boilers and a large amount of other boiler material, and examined for visual defects 4,522 applicants. Passengers to the number of 317,066,553 were carried on vessels which are required by law to report the number of passengers carried. The number of accidents resulting in the loss of life during the fiscal year was 247, and the number of lives lost was 1,276, including both passengers and crew. Of the lives lost, 192 were from suicide, accidental drowning, and other causes beyond the power of the Service to prevent, leaving a loss of 1,084 lives as fairly chargeable to accidents, collisions, explosions, foundering, etc. The lives of 917 passengers were lost, which, compared with the number carried, shows a ratio of 1 life lost for every 345,765. This compares with a loss of 107 passengers in the previous year, the excess being due to the sad loss of lives in the *Eastland* disaster. There was a decrease of 204 in the number of vessels inspected, and a decrease of 348,234 tons in the tonnage of vessels inspected, compared with the previous fiscal year. There were certificated 5,818 domestic steamers and 240 foreign passenger steamers. There were inspected 23 passenger barges, 574 seagoing barges, and 694 motor vessels. During the year there were examined and tested 203,017 life preservers. There were 2,741 reinspections of passenger and ferry steamers made by boards of local inspectors during the year, although for lack of money all reinspection work had to be stopped on June 3, during one of the heaviest months of navigation. This was particularly unfortunate, because reinspections are made without prior notice to the vessel and afford an invaluable means of supervision. During the year 28,019 applications were received for certificates of service as able seamen, 2,317 were rejected, and 24,425 certificates were issued. There were 29,323 certificates of efficiency issued to lifeboat men.

During the year the traveling inspector traveled over 15,080 miles, inspected 368 vessels in use, and found and reported 282 deficiencies of various kinds, which are detailed in the annual report of the Supervising Inspector General.

Expansion of the Service.

The great prosperity of the country is bringing serious additional demands upon the Service. More people travel, more go

on excursions, and more freight is shipped. The merchant marine is rapidly enlarging. The vessels are bigger; the demands for exhaustive inspections are greater. The expansion of our merchant marine is affecting the Service by the increase of the personnel, the demand for more numerous examinations for licenses, and the conducting of a larger number of investigations. All this means more men and more money. The work grows not only in volume but in quality. The public standard for it is higher; the law makes increased demands upon it, as, for example, by the provisions of the seamen's act.

Vessel Inspection.

In the old days the inspection of a vessel was a matter of hours, whereas now it is one sometimes of days. Under the old conditions the inspection was superficial, whereas under present conditions it goes into minute details to ascertain whether the vessel is in fact in proper condition to be certificated. To-day the local inspectors make careful inquiry to satisfy themselves that every vessel submitted for inspection is of a structure suitable for the service in which she is to be employed, has suitable accommodations for passengers and crew, is in a condition to warrant the belief that she may be used in navigation as a steamer with safety to life, and that all the requirements of law in regard to fire, boats, pumps, hose, life preservers, floats, anchors, cables, and other things are faithfully complied with. In the same way, also, the local inspectors give particular attention to the inspection of the boilers of steamers and their appurtenances before the same shall be used, and once in every year at the annual inspection are required to subject all boilers to the hydrostatic pressure. When a vessel is most carefully inspected with reference to hull, boilers, equipment, and appurtenances, the inspectors approve the same and make and subscribe a certificate of approval under oath.

For vessels of over 100 tons, subject to the inspection of the Service, blue prints are required to be submitted, descriptive of the hull, for the information of the inspectors, but these blue prints are not required to be approved by the local inspectors having jurisdiction. Therefore, in my last annual report recommendation was made for the creation of a corps of experts to be employed in the Office of the Supervising Inspector General whose business it would be to approve hull construction. For many years the law has required that blue prints of boilers be submitted to the local inspectors for approval, but it recommended in

my last annual report that the blue prints shall be approved in the Office of the Supervising Inspector General, under the direction of a corps of experts to be created for that purpose. The effect of this would be to have absolute uniformity in both hull construction and boiler construction. The Office of the Supervising Inspector General has carefully considered the desirability of so arranging its work as to require the local inspectors to furnish the central office with copies of blue prints of hulls and copies of blue prints of boilers in order that this information may be available at one central place, but this can not be done unless the personnel of the central office is increased, and, also, unless the personnel of the field service is increased. It is believed, however, that an increase in force would be justified for this purpose.

There was a time when it was thought impossible to build a fireproof excursion steamer, but with a constant demand for increased safety precautions men have commenced to give their attention to this most important matter. The subject of fireproof construction of excursion steamers may still be debated by some, but the fact remains that such a steamer can be built and prove a commercial success. If, upon the one hand, it be claimed that it is impossible to build such steamers absolutely fireproof and still carry large numbers of persons, the answer to that objection is that it may be necessary eventually to put a limit upon the number of persons that shall be carried on an excursion steamer, because, in the last analysis, safety is the first consideration and financial profit is the last. I have already referred to the advisory conference of May 3, 1916, on the subject of making passenger vessels more secure from destruction by fire. There was also held in the Department on May 22, 1916, a conference on automatic sprinklers on vessels. The idea of the Department is not to force fireproof construction on excursion steamers regardless of all other considerations, but rather to proceed in the consideration of the subject with an open mind and to obtain information, suggestions, and criticisms by those who are competent to furnish information upon this subject. The time is one for progress in the construction of vessels as in other matters. Men are not content to proceed along old beaten paths, but are seeking to meet new conditions as they actually are and to make vessel construction as completely up to date as are buildings or railroad cars.

The work of the Steamboat-Inspection Service has also expanded in connection with the inspection of motor boats. Hence the Department suggested that the name of the Service should be changed from Steamboat-Inspection Service to that of "Marine Inspection Service," because the Service touches, in its activities, not only the inspection of steamers, but also the inspection of motor boats and sailing vessels, and has to do not only with the licensing of officers of steamers, but also the licensing of officers of motor vessels and the certification of seamen and lifeboat men.

Years ago when a steamer was inspected and certificated, that was the end of it, but to-day not only do the local inspectors follow up the annual inspection by numerous reinspections, but the work of the local inspectors is followed by two traveling inspectors. It would be hard to overestimate the effect of the work of the traveling inspectors, for these men are discovering and correcting mistakes, oversights, and errors made by the local inspectors. By this is not meant that the local inspectors are not careful, but they are human, and it is necessary that there be a rigorous follow-up system on their work by the traveling inspectors, the supervising inspectors, and the central office.

Licensing of Men.

The Service licenses not only officers on steamers and motor boats subject to inspection and on certain classes of sailing vessels, but, as a result of the seamen's act, it has become necessary to certify thousands of able seamen and lifeboat men. In the work of certifying lifeboat men, the Service has been assisted by other officers of the Government specially designated for that purpose. It is the hope and plan of the Department, however, to be able in the near future to have the work of licensing lifeboat men done entirely by the inspectors of the Steamboat-Inspection Service. It will thus be seen that whereas once only the officers of vessels were licensed now the work of licensing has been expanded so that it covers the crew as well as the officers. This has resulted in an immense amount of work and will result ultimately in improved safety conditions on board ship.

Investigations.

In past years, while there were many investigations conducted, there was nothing like as many as to-day, for now everything is investigated. This in the aggregate will obtain good results and safer conditions, but it is not to be forgotten that the effective-

ness of investigations is impaired if there is not a sufficiently large personnel to conduct them promptly. It is therefore necessary that there be a larger number of assistant inspectors to do the actual work of inspection, while the local inspectors may give more of their time to conducting the investigations and trials of licensed officers.

In connection with the work of conducting investigations the Department believes that it would be well that copies of testimony of all investigations and trials be forwarded to the central office. It may seem surprising to some that this has not been done, but it is due to the fact that the personnel of the Service has not been sufficiently large to permit of the work being properly done in the field service by the clerks in transcribing their notes or for the work of reviewing the testimony being done in the central office. It is the desire of the Department that the testimony in every case shall be carefully reviewed, for in this way errors can be corrected and the local inspectors can be instructed accordingly.

Rehabilitation of the American Merchant Marine.

The work of the Service would in any event have increased from this time forward, because of the fact that the American merchant marine is again being surely built up. In that work the Service can have no small part, because, just as intelligent regulations are made and intelligently and equitably enforced, just to that same extent does the Service assist or retard the development of the American merchant marine.

It is not out of place when discussing the subject of the upbuilding of American shipping to make reference to a most excellent pamphlet that was prepared for the Department of Commerce by E. Platt Stratton, formerly Supervisor of the American Bureau of Shipping, which is entitled "Standardization in the Construction of Freight Ships." The author has ably brought to bear upon a most interesting and vital subject an immense amount of information and the results of a peculiarly valuable training and experience. The suggestions that are made in that pamphlet may well receive the careful consideration of American shipbuilders. It should be the pride of this country that its shipyards should be the best in the world. As an economic proposition it may be that both shipowners and shipbuilders can learn fruitful lessons by a careful study of the pamphlet above referred to.

The work of the Service has increased immensely as a result of admittance to American registry of many foreign-built ships, and as the time approaches when these vessels will be subject to the same inspection as American-built ships it can be appreciated that the inspectors of the Service on the coasts will be most busily occupied in examining these vessels preparatory to the issuance of certificates of inspection.

Increase of Force.

The increase of the inspecting force by 31 was opportune. The time had come when it was useless for Congress to pass more laws looking to safety on board ship or for the Board of Supervising Inspectors to make further regulations in regard to the subject until a sufficient number of men was furnished to enforce the provisions of the laws and the rules and regulations that already existed. Large as the increase was in the number of inspectors, a sufficient number has not yet been furnished, and it is necessary that a material increase be made in the number of inspectors in the near future in order to carry on the work of the Service satisfactorily.

As I have already said, when the number of inspectors was increased Congress made no corresponding increase in the number of clerks. Such an increase is a crying need at the present time, especially in the field service. There should be an increase in the number of clerks, so that the work that is at present required may be properly done, and so that the Bureau may undertake new work that will result in better inspection. The amount of overtime put in by both inspectors and clerks is large, far too large. Provision must be made for a larger number of men to do the clerical work unless the Service is to suffer.

Larger Appropriations.

It necessarily follows that inasmuch as the Service is expanding, as has been referred to in the preceding paragraphs, there must be more money provided in order that it may properly carry on its work, and this money should be available not only for the payment of adequate salaries, but also for contingent expenses. If more money is furnished in the contingent fund, more supervision could be undertaken of vessels and the work of the local inspectors could be better followed up by the supervising inspectors, who, true to their title, should be constantly engaged in supervising their districts. These men are now kept busy, but their activities could be directed more effectively if more money were provided.

Division of Districts.

The absurdity of one supervising inspector on the Pacific coast charged with the supervision of the vessels of California, Oregon, Washington, Alaska, and Hawaii, including the Sacramento, Columbia, and Snake Rivers, still continues. The chart herewith, reprinted from my previous report, speaks for itself. No man can cover such a task. The work is not done and can not be done even by a superman, as under the existing conditions it is supposed to be.

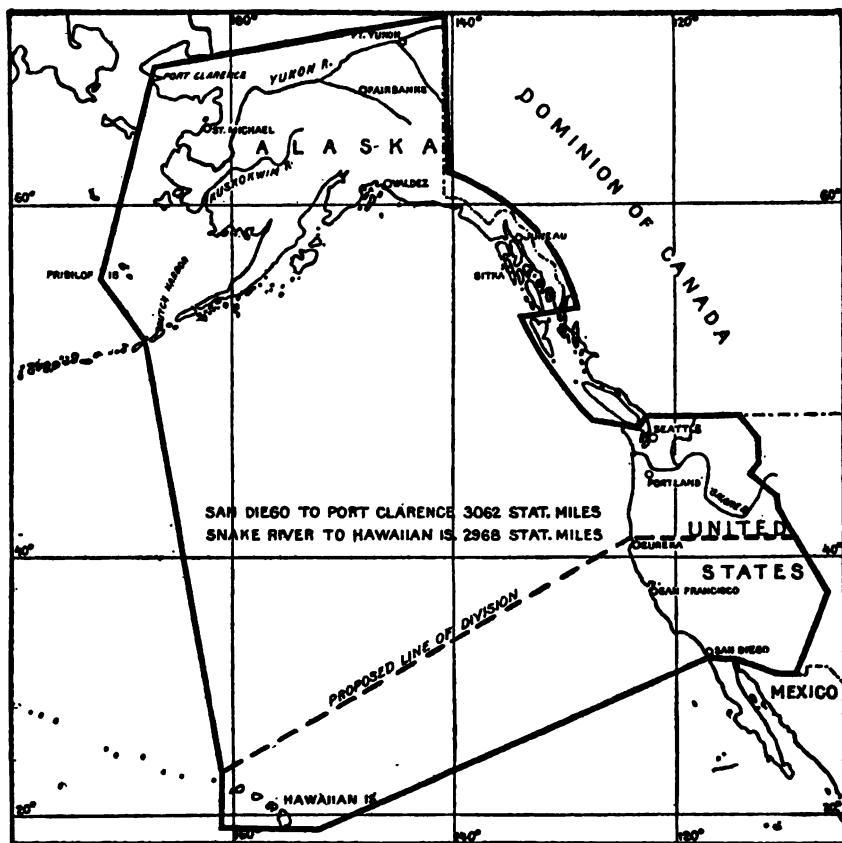


FIG. 16.—First steamboat-inspection district, now supervised by one inspector.

Let one read the law which says that "each supervising inspector shall watch over *all parts* of the territory assigned to him, shall *visit*, confer with, and examine into the doings of the local boards of inspectors within his district, and shall instruct them in the proper performance of their duties," etc., and also provides (sec. 4408, Rev. Stat.) that "the supervising inspectors shall see that the several boards of local inspectors within their respective districts

execute their duties faithfully, promptly, and, as far as possible, uniformly in all places," etc.

With this in mind, ask how one supervising inspector can comply with this law in a district which reaches from the Arctic Ocean to the Tropics and from Idaho to Hawaii. Were there such a superman, funds are not sufficient. It is earnestly to be hoped that this absurd arrangement will be ended by legislation to provide for two districts on the Pacific.

"Eastland" Inquiry.

The unusual loss of life reported for the fiscal year arises from the sad disaster to the *Eastland*. The action taken in this matter was fully covered on pages 196 to 200, inclusive, of my last annual report. Legislation carrying out the recommendations of the board of inquiry into that disaster was introduced in Congress. I have already shown that little of it was enacted into law. The further proceedings in the *Eastland* case are necessarily suspended pending the action of the courts on the indictments against the licensed officers of the vessel.

Overloading of Passenger Excursion Steamers.

To the average person it often seems that more passengers are on board a steamer than are actually present. There are many who will sincerely say that on a steamer permitted to carry 2,000 persons there were 4,000 people and that the inspector at the dock has not correctly counted them. Others, more conservative, will say that while a larger number of persons was not on board than permitted by the certificate of inspection the inspectors have permitted too large a number in the certificate. These last persons are nearer the truth than the former ones. This does not mean that the local inspectors, who are charged with the responsibility of passenger allowance, have not exercised care in making that passenger allowance. They are undoubtedly the best informed persons as to the number of people that should be permitted to be carried on excursion steamers subject to their jurisdiction. At the same time, it is not denied that the local inspectors are human and that the judgment of men is not the same. Therefore, while in one instance an inspector may refuse to permit a sufficiently large number of persons to be carried, in another instance an inspector may permit too large a number to be carried. The question therefore arises, What is the solution for this condition

of affairs? It would be found if due consideration were given to this matter that the question would be very difficult to answer without taking into consideration many varying conditions. Upon the one hand, it may be suggested that legislation should be enacted to control this feature of inspection. Upon the other hand, it must be said that no matter what legislation is enacted there is hardly any measure that could be provided that would not work hardship. Furthermore, it is probable that no matter how carefully a law might be worded it might overlook some unsafe conditions that would result in disaster. The Bureau intends, however, by suggestions now under study, and which it hopes to formulate by the spring of 1917, to further control the situation so as to bring about safer conditions and in many instances to reduce the passenger allowance on certain classes of vessels.

Transportation of Dangerous Articles.

From time to time recommendations have been made that some change should be made in the law so as to give some control over the transportation of dangerous articles on freight vessels, and also to enable the Bureau to formulate intelligent regulations controlling the transportation of certain inflammable and dangerous articles on steamers carrying passengers. In the present state of the law there is no control over the transportation of dangerous articles on freight vessels, and the law sometimes brings about absurd conditions in the transportation of dangerous articles on passenger vessels. It is believed, therefore, that it would be well if the law was so amended as to give the Office of the Supervising Inspector General authority to formulate regulations with reference to the transportation of dangerous articles on all classes of vessels subject to the inspection of the Service.

Passengers on Ferryboats.

There is at present no legal limit to the number of persons a ferry steamer may carry, and therefore nothing to prevent a ferryboat from carrying passengers in excess of a safe limit. The Department has urged that this be corrected and favors bill H. R. 4781, introduced for that purpose. The efforts of the Department have been opposed by the officials of the city of New York, and so far no action has been taken. While there is no doubt that the opponents of the measure are sincere in their attitude, the Department feels that it is both possible and desirable that a

limitation should be authorized. The following correspondence will show the Department's attitude:

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, March 1, 1916.

HON. DUNCAN U. FLETCHER,
United States Senate.

MY DEAR SENATOR FLETCHER:

I think a further statement is desirable concerning Senate bill 1222 (H. R. 4781), in order to make the issue concerning that measure clear. The question raised is this, to speak plainly: Shall ferryboats continue unlimited and without restriction as to the number of passengers they can carry and without being obliged to have life preservers sufficient to accommodate all on board? This is the condition under the present law. I disapprove this condition. I am unwilling to assume myself or to have my associates assume the responsibility for a continuance of this condition. I do not care to have upon my conscience the possible loss of life in some serious accident because of neglect on my part in a matter of this kind. My duty obliges me to urge in the strongest way that the utmost practicable safeguards of law be placed upon these vessels, and I earnestly hope you will concur with me.

Ferryboats frequently, and in New York Harbor especially, navigate waters in which the danger of collision is peculiarly great and in which, as a matter of fact, collisions do constantly occur. I hand you copy of report dated February 28 of a collision between two ferryboats in New York Harbor arising from dense fog and heavy traffic. Fortunately, nothing serious happened. No lives were lost. But you will observe that this collision took place despite the fact that "both these vessels were proceeding carefully, sending the usual fog signals." The report further says, "The necessary lookouts were maintained. The vessels were so close to each other when sighted that there was little room to answer, and the board is of the opinion that the collision came about as a result of misunderstanding of signals due to fog with the accompanying whistle signaling in an area of heavy traffic."

I am myself familiar with the traffic conditions in New York Harbor. I have made many trips on the crowded ferryboats, and I think the condition of permitting them to carry an unlimited number is wrong, and I protest against its continuance.

On the other hand, many of the objections raised are wholly imaginary. It is quite practicable to handle the matter in such a way as to occasion no material inconvenience, and I assure you that every effort would be bent to this end in the event that the bill became law.

Whether this shall be the case or not I want this Department to be on record as favoring every practicable safeguard to life and asking that all be done within reason for its protection.

A letter similar to this has been sent to Judge Alexander, chairman of the House Committee on the Merchant Marine and Fisheries.

Yours, very truly,

WILLIAM C. REDFIELD, *Secretary.*

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, May 26, 1916.

MR. R. A. C. SMITH,
Commissioner of Docks and Ferries, New York, N. Y.

MY DEAR SIR:

Permit me to quote a letter from the postmaster at San Francisco dated the 19th instant, as follows:

"I had occasion on Sunday afternoon, May 14, 1916, to cross the bay on the ferry steamer plying between Sausalito and San Francisco, a distance of approximately

six (6) miles. This crossing is made at that point of the bay directly opposite the Golden Gate, and, due to high winds, fogs, and strong tides, it is the roughest on the bay.

"On this occasion my attention was called to the crowded condition of the boat. Not alone was every seat occupied, but the aisles and decks were crowded with people standing. I inquired of one of the officers as to the law on the limitation to the number of passengers that might be carried, and was informed in rather an indifferent manner that the only restriction was that there should be a life preserver for each passenger on board. The officer seemed to resent my inquiry and rather taunted me, saying the present Congress had refused to pass a law safeguarding the lives of passengers on ferries."

I hand you copy of my reply to him. I am informed by a passenger who recently crossed the Tottenville ferry that the boat was so crowded there was great difficulty in getting the front chain fastened across the bow to safeguard the passengers. This Department regards a limitation upon the number of passengers permitted on a ferryboat both feasible and necessary. It believes that the present conditions are certain to result in serious loss of life in some accident. It has, as you know, done all in its power to secure authority to limit the number of passengers, but largely through your opposition it has failed to receive that authority. Your attention is called, therefore, to the complaint herein and to the answer we have to make and to the statement which I now desire to place on record that the Steamboat-Inspection Service of this Department, with my full concurrence, regards existing conditions as a menace to safety and that it must be absolved from all responsibility should any disaster occur in which there is loss of life arising from an excessive number of passengers on any ferryboat anywhere in the country, and that those must accept the responsibility through whose opposition lawful power to prevent such a disaster was withheld.

Yours, very truly,

WILLIAM C. REDFIELD, *Secretary.*

The Department does not desire to impose any hardships upon the owners or operators of any ferryboat and believes it quite possible to regulate the matter sufficiently without so doing. It is conceded that ferry operators are commonly properly solicitous of the safety of their passengers and that they would not willingly oppose methods to protect the lives of such passengers. At the same time the fact remains that there is now no such lawful protection provided, and this condition ought not to continue. The Steamboat-Inspection Service has at present no power in the matter, but it is ready to cooperate when it has authority with any parties interested to bring about the desired result.

Limited Authority to Investigate Marine Disasters.

There is at present no general authority of law for investigating marine disasters. Authority exists only to inquire into the conduct of licensed officers on such occasions. If, for example, there were an accident in which all the licensed officers were killed, as in the case of the towing steamer *Sam Brown* on February 2, 1916, the Department has no lawful authority to investigate the cause of disaster. This would be true of an accident to an ocean vessel in which the licensed officers were lost. Authority

should be given to the Steamboat-Inspection Service to investigate marine disasters occurring on any vessels under its supervision. The experience of the Service confirms the recommendation made on page 205 of my last report, which said:

A tribunal should be lawfully established for investigations into marine casualties involving serious loss of life, similar generally to the courts of inquiry provided for in the British merchant shipping act and the Canadian merchant shipping act.

Fusible Plugs.

Special attention has been given during the year to the safety conditions created by the use of fusible plugs. In this matter the Bureau of Standards has ably assisted. The practice of the Steamboat-Inspection Service as regards the use of fusible plugs is in advance of that of both the Navy and the Coast Guard and is setting to them an example of a high standard of safety practice which is to be commended.

Salaries of Assistant Inspectors.

On July 18, 1916, the assistant inspectors of steam vessels at San Francisco forwarded to me a respectful petition for an increase in salary, in which they said, with truth:

The work of the Steamboat-Inspection Service at this port has increased greatly owing to increase in tonnage of vessels inspected and the higher standard at which the Service is maintained at this time, whereas the salaries paid assistant inspectors have remained stationary for many, many years. * * * The cost of living is so much greater at this time than it was at the time our present salaries were fixed that we find it a very hard struggle to properly rear our families.

They add, with equal truth:

The salaries received by men in kindred occupations in the maritime world, such as masters, mates, and engineers, with whom we come in contact daily in the performance of our duties, is so much in excess of the salaries received by us it seems to have a tendency to lessen the respect due inspectors in this Service.

Finally, they add a suggestion that is pertinent for the present and future good of the Service in saying:

The meagerness of the salaries paid assistant inspectors for the quality of work required is one of the reasons why the best men are not now taking the civil-service examinations for these positions.

The request of these worthy officers is as forceful as courteous. It is for the good of the country that their compensation should be made more commensurate with the value of the duties rendered by them.

Protection of Dredge Workers.

On May 20, 1916, the president of the International Dredge Workers Protective Association, at Chicago, wrote me asking

help to get better protection for their men who go out on scows 8 miles into the lake. He said:

These steel scows have no life guards or shelter of any kind for a man to get away from the storms. * * * The scows are loaded down to a foot above the water, and the sea sweeps right over them. The tugs let out about 800 feet of cable, and no one can see if anything has gone wrong on the scows.

To this he adds that about 12 men have been lost from these scows at different times. In reply, I told Mr. Flannery, the president of the above association, that I should emphasize the need of better laws for the protection of these men in my annual report. I now do so. I regret exceedingly that the law gives this Department no jurisdiction over such scows or over their equipment or navigation. At present the Service is powerless. I earnestly hope that Congress will realize the humane necessity of providing for the protection of these men and will give us power to regulate matters in their behalf.

Work for Other Departments.

The work done by the Steamboat-Inspection Service for other departments of the Government is constantly increasing until now it has become a factor to be carefully considered in administering the work of the Bureau. If the demands continue, it will be necessary to have a larger force of inspectors to do this Government work, or perhaps a special force assigned to it, or arrangements will have to be made for somebody else to undertake the work.

Archaic State of Inspection Laws.

The laws under which the Steamboat-Inspection Service operates are archaic and should be revised. They are vague, out of date, and in some respects contradictory. They do not provide for an organization of the Service suited to modern conditions. Authority is scattered. Differences of practice on vital matters are permitted, and until there is a change it is difficult to standardize the Service. An inquiry has been made by a committee of the Chamber of Commerce of the United States, whose report will, I trust, deal frankly with this phase of the subject. As things now are, authority has more or less at times to be assumed to do particular things under general powers. The spirit of the Service is admirable. Its standards are high. Its practices were never so efficient as to-day. It can not, however, reach the perfection at which it aims until it has a modernized law behind it and a sufficient office and field staff to do its work.

BUREAU OF NAVIGATION.

Increased Duties of the Bureau.

In my last annual report I stated that Congress had imposed serious additional duties upon this Service without giving any added compensation to the Commissioner of Navigation for these great additions to his responsibility and without allowing him any additional force with which to do the larger work. I then said that it was an act of simple justice that under the onerous conditions imposed by law on him his salary should be made equal to that which others similarly situated receive. I therefore included in the estimates for the present fiscal year an increase in the salary of the Commissioner of Navigation from \$4,000 to \$5,000. It was not granted. I now specifically state the added burdens placed upon this Service, as follows:

On August 18, 1914, Congress passed the act permitting the registry of American-owned foreign-built vessels for our foreign trade. Under this act there have been admitted 187 vessels of 623,717 gross tons. The increase in our foreign fleet has been of vital value during the war and has involved determination of many new questions and the readjustment of a great deal of work to the new conditions.

The Hardy Act, of March 3, 1913, increased the number of licensed officers to be carried on vessels. This brought a serious additional load to the Service because there was an insufficient number of licensed officers to meet the condition of the law along the Atlantic and Gulf coasts. There were hundreds of violations of this law which the Service has had to handle, and it has been difficult and laborious to adjust the act to existing conditions.

The wireless communication law of July 23, 1912, and the radio communication act of August 13, 1912, involved the creation of a new service covering the inspection of every wireless station in the United States and those on vessels leaving our ports under certain conditions. It also required licensing shore stations and stations on American ships, the examining of operators, and the general supervision of a highly technical service.

On February 24, 1915, Congress passed the act admitting as vessels of the United States foreign vessels wrecked on our coasts

or on adjacent waters and owned by Americans and repaired in American shipyards. Under this act 7 vessels of 11,630 tons have come in. Each of these cases requires a careful consideration and in some instances the appraisal of the value of the vessel in her salvaged condition.

The deficiency appropriation act of July 29, 1914, transferred to the Bureau of Navigation the employment of 62 navigation inspectors, requiring the creation of a civil-service register, the organization of the force, its assignment to various districts, the supervision of the work, and the handling of the large number of fine cases reported by these men.

The act of August 22, 1914, provided for the use of gasoline engines as emergency power for lights and wireless apparatus on passenger vessels. This required investigation by the Service into the efficiency and performance of these auxiliary engines.

The act of March 4, 1915, enables the consular officers to issue provisional certificates of registry to vessels abroad purchased by citizens of the United States. The application in detail of this wholly new principle in American legislation has required careful attention from the Service.

On March 4, 1915, the passage of the seamen's act placed upon the Bureau of Navigation a great additional burden of new work. The adjustment of the law to the conditions then existing was a matter of long, hard, patient labor.

In addition to the above express requirements of law, the Bureau of Navigation was called upon to do much of the work of American preparation for the International Conference on Safety of Life at Sea, held in London in November and December, 1913, and January, 1914.

If the above additional duties, none of which formed any part of the work of the Service when the existing salaries were fixed, are not sufficient to justify added compensation, it should be noted that there has been an unprecedented increase in our foreign-going fleet. In three years the tonnage of this fleet has more than doubled, and there are to-day building in our shipyards the unprecedented number of 417 steel vessels, being a total of 1,454,270 gross tons of steel ships. Each of these ships must be documented and admeasured and inspected as regards her radio apparatus when same is used. Meanwhile the annual number of seamen shipped and discharged under the supervision of the Service has grown in two years from 378,772 to 487,524.

The situation, then, is that, under conditions in which both by the development of the country and by express acts of Congress serious additional burdens have been placed upon this Service, no account has been taken of these things in the compensation of the men who must do the work. The salary of the Commissioner and the Deputy Commissioner remain as they were fixed in 1884. I therefore renew my recommendation that the salary of the Commissioner of Navigation be made \$5,000 and recommend that the salary of the Deputy Commissioner be increased from \$2,400 to \$3,000 and that of the chief clerk from \$2,000 to \$2,400. Our estimates also include a necessary addition for the clerical force of this Service.

Total American Merchant Marine.

American merchant shipping registered for the foreign trade and enrolled or licensed for the coasting trade and fisheries on June 30, 1916, comprised 26,444 vessels of 8,470,946 gross tons. The following statement shows the condition of our merchant marine at the close of each of the last four fiscal years, and at a glance discloses the extent and direction of its development during this interesting period in the world's history.

Year ended June 30—	Foreign trade, registered.	Coasting trade, enrolled, licensed.		Total.
		Great Lakes.	Sea and rivers.	
	<i>Gross tons.</i>	<i>Gross tons.</i>	<i>Gross tons.</i>	<i>Gross tons.</i>
1913.....	1,027,776	2,939,786	3,918,956	7,886,518
1914.....	1,076,152	2,882,922	3,969,614	7,928,688
1915.....	1,871,543	2,818,000	3,699,886	8,389,429
1916.....	2,193,286	2,760,815	3,516,845	8,470,946

The increase has been due chiefly, of course, to the facts that a great portion of the tonnage of the world has been employed for military purposes and another portion has been destroyed by acts of war, that merchant shipping of belligerents sought at the outset of war the shelter of neutral ports and has remained there, and that the shipyards of the warring powers have turned their energies to naval and military production and have reduced their output of merchant shipping. Fortunately, Congress the day before the war began had taken up a measure necessary to meet the situation foreshadowed and before the war was a fortnight old had passed the ship-registry act for the admission of

foreign-built ships to American registry for foreign trade. The measure was passed in an emergency, but it was not an emergency measure, as it rested on a principle adopted years ago by other maritime nations and repeatedly advocated in recent years in Congress. The total increase in our merchant shipping during the past four years has been 584,428 gross tons. Abroad both belligerent and neutral nations recognized that during the war the American flag offered apparent advantages, particularly against submarine attack, and that the ship-registry act of 1914 would increase American shipping at the obvious expense of foreign shipping. Naturally, therefore, other nations promptly took measures to prevent the transfer of their merchant ships during the war period to foreign flags. Between February 12, 1915, and June 30, 1916, the following nations passed laws or issued decrees prohibiting, under penalties, during the war the transfer of merchant ships under their respective flags to the flags of other countries: United Kingdom, Germany, Norway, France, Italy, Netherlands, Russia, Sweden, Austria-Hungary, Denmark, Spain, Greece, Brazil, and Belgium.

The merchant shipping of these nations in June, 1916, comprised 39,429,471 gross tons out of a world's total of 42,534,275, excluding American shipping. Possibly other nations have passed similar laws of which the Department of Commerce has not yet been advised. An effect of these measures is seen in the small amount of foreign tonnage transferred to the American flag during the fiscal year 1916 compared with the fiscal year 1915. A considerable tonnage, probably over 200,000 gross tons, representing American investment of capital before the war, but owned in the name of foreign corporations, could not be transferred in view of these measures of foreign nations. During the past fiscal year, in fact, while the foreign tonnage transferred to the American flag has comprised only 34 vessels of 92,439 gross tons, the American tonnage transferred to foreign flags has comprised 160 vessels of 102,479 gross tons, of which the largest were the steamships *Siberia*, 11,306 gross tons, *Robert Dollar*, 5,356 gross tons, and *Constitucion*, 3,358 gross tons, transferred to the Japanese; *Oceana*, 7,796 gross tons, transferred to the Spanish; and *M. S. Dollar*, 4,216 gross tons, transferred to the British flag. In each of these cases the vessel was actually sold to foreign owners. Up to October 30, 1916, during the current fiscal year, 48 American vessels of 76,880 gross tons have been sold to foreigners.

The ship-registry act during its brief operation up to June 30, 1916, added, as stated, 615,800 gross tons to our merchant shipping. Domestic shipbuilding has also added its quota, while the principal subtractions, of course, are due to the loss or abandonment of vessels and sales to aliens. The operation of these causes during the past four fiscal years is indicated briefly in the following statement:

Year ended June 30—	Built in United States.	Lost or abandoned.	Sold to aliens.
	<i>Gross tons.</i>	<i>Gross tons.</i>	<i>Gross tons.</i>
1914	146,155	101,296	51,373
1915	116,290	87,287	38,676
1916	125,120	81,499	18,305
1917	125,474	103,124	108,479
Total	512,949	373,196	206,763

Besides the positive forces adding to or subtracting from our merchant shipping, other forces under the laws operate to affect statistical returns, though not affecting the actual volume of shipping. In certain trades our laws take cognizance of some types of vessels and in other trades exempt them from navigation papers. Thus a barge in a harbor is not required to be enrolled and included in the returns, while the same barge in trade to another State must carry papers and will be included in the returns. Such changes, considerable every year, materially affect the legal total of our tonnage, but do not, of course, affect the physical facts of shipping.

While American tonnage in foreign trade has more than doubled in four years, our tonnage in the coasting or domestic trade has diminished nearly 10 per cent. The heavy ocean freight rates which foreign nations are willing to pay to secure the products of our factories, farms, and mines have attracted 10 per cent of our shipping from transportation service between our own ports to the transportation service abroad. The ocean trade routes followed by increased American shipping is indicated by the following statement of the tonnage clearances of American ships for foreign ports in 1914 and 1916, clearances being expressed in net tons of 100 cubic feet available for cargo or passengers, and the same ship, of course, usually clearing several times during a year and thus appearing several times in the total.

Clearances for—	1914 tonnage.	1916 tonnage.	Increase.
Europe.....	447,667	1,134,952	687,285
South America.....	192,479	945,353	752,874
Asia.....	72,218	131,198	58,980
Australia, etc.....	28,615	157,390	128,775
Africa.....	4,263	79,412	75,149
Total.....	745,242	2,448,305	1,703,063

Trade to the foreign ports of our own continent and to near-by islands, where the same ship makes many voyages annually, calls for the following separate statement of American clearances:

Clearances for—	1914 tonnage.	1916 tonnage.	Increase.
Nova Scotia and British Columbia.....	1,854,058	1,998,805	144,747
British West Indies and Bermuda.....	138,073	266,163	128,090
Cuba.....	871,506	1,810,358	938,852
Panama.....	500,009	1,139,889	639,880
Mexico, Haiti, and Dominican Republic.....	964,553	1,691,412	726,859
Central America and West Indies, except British.....	66,883	390,150	323,267
Total.....	4,395,082	7,296,777	2,901,695

Of 38,895,261 net tons of shipping cleared on ocean voyages to foreign ports during the fiscal year ended June 30, 1916, 9,745,082 net tons, or 25 per cent, were American. In the fiscal year 1914, of 39,622,486 net tons, only 5,141,324, or 13 per cent, were American.

World's Merchant Shipping.

The growth of American shipping in foreign trade is satisfactory not only from our own comparative records but also by comparison with the changes in the merchant shipping under foreign flags. To an extent these have been coincident with the operation of the ship-registry act, for transfers which have added to our tonnage, of course, have decreased tonnage under foreign flags, particularly the British and the German. The best available return on the world's merchant shipping at the present time is in Lloyd's Register of Shipping for the year ended June 30, 1916. The figures include only vessels of 100 gross tons or over and do not usually include river vessels or unrigged barges, which comprise a considerable part of American tonnage and of the tonnage of nations along the banks of the Rhine, the Danube, and other

large rivers. The changes effected during the war period are shown by the following table:

Flag.	1914		1916		Increase (+) or decrease (-).
	Number.	Gross tons.	Number.	Gross tons.	
British.....	11, 328	21, 045, 009	11, 141	20, 901, 999	— 143, 050
American:					
Sea.....	2, 490	2, 970, 284	2, 587	3, 790, 578	+ 820, 294
Great Lakes.....	620	2, 352, 764	598	2, 318, 223	— 34, 541
Philippine Islands.....	74	45, 146	66	40, 060	— 5, 086
Total American.....	3, 174	5, 368, 194	3, 245	6, 148, 861	+ 780, 667
German.....	2, 338	5, 459, 296	1, 953	4, 151, 551	— 1, 307, 744
Norwegian.....	2, 191	2, 504, 722	2, 255	2, 771, 022	+ 266, 300
French.....	1, 576	2, 329, 438	1, 510	2, 226, 643	— 102, 795
Italian.....	1, 160	1, 668, 296	1, 220	1, 896, 534	+ 228, 238
Japanese.....	1, 103	1, 708, 386	1, 151	1, 847, 453	+ 139, 067
Dutch.....	806	1, 406, 455	792	1, 508, 916	+ 102, 461
Russian.....	1, 245	1, 053, 818	1, 251	1, 068, 500	+ 14, 682
Swedish.....	1, 466	1, 118, 086	1, 380	1, 025, 000	— 93, 086
Austro-Hungarian.....	445	1, 055, 719	396	892, 618	— 163, 101
Danish.....	822	820, 181	854	857, 602	+ 37, 421
Spanish.....	647	898, 823	606	809, 836	— 88, 987
Greek.....	485	836, 868	439	733, 276	— 103, 592
Other flags.....	2, 091	1, 736, 221	1, 858	1, 833, 272	+ 97, 071
Grand total.....	30, 836	49, 069, 552	30, 167	48, 683, 136	— 406, 416

Judged by international standards our recent maritime growth is as gratifying as when measured only by our own returns. After two years of conflict the world's merchant tonnage is not quite 1 per cent less than before hostilities were declared, although during the interval merchant shipbuilding has been wholly or partly abandoned by some of the nations at war. During the two years before the war merchant shipping increased from 44,600,677 tons in 1912 to 49,089,552 tons in 1914, or about 10 per cent.

American Shipbuilding.

During the fiscal year ended June 30, 1916, all American shipyards built 937 merchant vessels of 325,414 gross tons, compared with 1,157 vessels of 225,122 gross tons for the previous year. These figures cover vessels completed and documented for trade at the customhouses. It does not include vessels launched but not documented up to the end of the fiscal year. In my report last year it was estimated that this year's output doubtless would be 400,000 gross tons. The conditions which ob-

yards and, indeed, through our steel industries in the spring and early summer of 1916 are generally known. The demands upon such plants taxed them to their maximum capacity, and the demand for skilled labor, especially in shipyards, often exceeded the available supply. Wages generally were increased and strikes occurred in some shipyards. Delays in construction involving about 80,000 tons of ship construction were thus inevitable, and the finished product of our yards, accordingly, is less than was estimated a year ago. The total volume of construction under way or undertaken during the year greatly exceeds, however, the most sanguine expectations of our shipbuilders a year ago.

Since my last annual report the shipbuilding industry of the United States has ceased to hold the position merely of a domestic industry, and through the skill and enterprise of our builders, naval architects, and capitalists has become a matter of prime international interest and concern, as, for the time at least, it must be a main source of supply of new ships for the prosecution of the world's foreign trade. During the first six months of 1916 American shipyards completed and the Bureau of Navigation officially numbered 524 vessels of 240,055 gross tons, while during the same period British shipyards, according to Lloyd's returns, launched 160 vessels of 238,255 gross tons. In June, however, British yards more actively resumed merchant shipbuilding, and during the nine months up to October 1 they had launched 246 vessels of 430,522 gross tons. In the same period American yards had completed 846 vessels of 361,113 gross tons for American owners and 5 vessels of 17,203 gross tons for foreign owners, a total of 851 vessels of 378,316 gross tons. Some of the British ships launched await engines and machinery, the output of which is still delayed by the demands of the munitions department.

The current fiscal year opened, accordingly, with the promise of the largest output of American shipyards in our history. On July 1, 1916, work had actually begun, according to the returns of shipbuilders, on 186 steel vessels of 699,658 gross tons, and under normal industrial conditions all this tonnage should be completed during the current fiscal year. During the calendar year 1915 British yards launched 650,919 gross tons. In addition American shipbuilders were under contract to build 199 other steel merchant vessels aggregating 526,126 gross tons, a portion of which will be completed during the current fiscal year, but the greater part

of which will not be completed before the fiscal year ending June 30, 1918.

On October 1, 1916, American shipyards were building or under contract to build 417 steel merchant ships of 1,454,270 gross tons. Of this tonnage the builders at that date expected to launch 326 ships of 998,035 gross tons before the end of the current fiscal year. Some yards are working the full 24 hours with three shifts of men, and in some instances bonuses have been offered to builders and by builders to their employees for delivery in advance of the contract date. This does not include the wooden shipbuilding in many smaller yards. This product is usually about 100,000 gross tons annually and will be greater during the current year.

I have already stated that the present tonnage building in American yards includes 195 ocean steel steamers of over 1,000 gross tons each, aggregating 1,037,103 gross tons.

On December 31, 1913, German shipyards were building or under contract to build 104 ocean steel steamers, each of over 1,000 gross tons, aggregating 810,520 gross tons, the largest volume of work in the Empire's history. Much of this tonnage, on account of the war, is not yet completed.

The naval appropriation act of August 29, 1916, provides the largest building program for the Navy in history. At an estimated cost of \$588,000,000, battleships, battle cruisers, scout cruisers, and other types of warships and auxiliaries, numbering 157 and of approximately 855,000 tons displacement, are to be built during the next five years in private and Government shipyards. Of these, 66 of about 382,000 tons displacement are to be begun as soon as practicable and the remainder before July 1, 1919. The current fiscal year practically opened, accordingly, with about two and a quarter millions of tons of merchant and naval shipping, valued roughly at \$800,000,000, under construction, ordered, or to be ordered as rapidly as our shipyards, Government and private, can undertake the work.

So many uncertain factors enter into the prosecution of this work that it is inadvisable to make any more precise conjecture than has already been made as to the merchant shipping which will be completed during the current fiscal year. Our steel industries must furnish an extraordinary amount of materials for shipbuilding, at home and abroad; our shipbuilding plants, already increasing in number and facilities, must be further extended; and the number of skilled mechanics must be increased. Transpor-

tation must be uninterrupted, and capital and labor must work together on mutually satisfactory terms. Events have combined to afford the opportunity this year to establish the shipbuilding industry in the United States in a firm position for years to come. It is not probable that in the immediate future we shall again come so nearly to rivaling Great Britain's primacy as a shipbuilding nation as we do at the present time, for shipbuilding is one of the foundations of the British Empire, while shipbuilding and the merchant marine can hardly—at least for years to come—equal the railroads in importance to the development of America. We are, however, now so far in advance of all other powers than Great Britain that only the failure to make full use of present opportunities can deprive us of the second place among shipbuilding nations. It is gratifying that our shipyards are building for foreign as well as for American owners. This trade, I trust, may be retained through the excellence of our work and the reasonableness of our prices. It will then become a real and abiding source of national strength as well as an advantage to our labor and capital.

Our shipowners and shipbuilders, wisely, are chiefly devoting themselves to building cargo boats needed to meet the requirements of the present time and of the years just ahead. The use of oil as fuel on ships, on railroads, on motor cars and trucks, and in manufacturing plants was growing before the conflict broke out and has received a tremendous impetus from the conditions of modern warfare. Last year's report noted the fact that oil tankers comprised a third of the tonnage brought under the American flag by the ship-registry act of 1914. Of the tonnage now building in our shipyards, oil tankers number 80, of 500,000 gross tons, or nearly half of the total. The export of coal has been one of the sure sources of strength of British trade and maritime rank, and in the same fashion to an extent the export of oil from North America is contributing and will continue after the war to contribute to our export trade and rank as a sea power.

World's Shipbuilding.

The world's merchant shipbuilding reached its maximum in the calendar year 1913, when, according to Lloyd's Register, 1,750 ships, of 3,332,882 gross tons, were launched. Lloyd's returns, as stated, do not include vessels under 100 tons, river vessels, barges, etc. The changes wrought in merchant shipbuilding by the war are shown by the following return for the calendar years 1913, 1914 (for five months of which work in most yards was modified

by conditions created by the war), and 1915, when the full effects of the war are shown:

Where built.	1913		1914		1915	
	Number.	Tons.	Number.	Tons.	Number.	Tons.
United Kingdom.....	668	1,932,153	656	1,683,553	327	650,929
British colonies.....	91	48,339	80	47,534	31	22,024
Austria-Hungary.....	17	61,757	11	^a 34,335	(b)	(b)
Denmark.....	31	40,932	25	32,815	23	45,298
France.....	89	176,095	83	114,052	6	25,402
Germany.....	162	465,226	89	^a 387,192	(b)	(b)
Italy.....	38	50,356	47	42,981	30	22,132
Japan.....	152	64,664	32	85,861	26	49,428
Netherlands.....	95	104,296	130	118,153	120	113,075
Norway.....	74	50,637	61	54,204	59	62,070
Other countries.....	108	61,979	61	51,311	37	33,960
Foreign total.....	1,545	3,056,434	1,225	2,651,991	659	1,024,178
United States:						
Coast.....	182	228,232	84	162,937	76	157,167
Great Lakes.....	23	48,216	10	37,825	8	20,293
Total for United States.....	205	276,448	94	200,762	84	177,460
Grand total.....	1,750	3,332,882	1,319	2,852,753	743	1,201,638

^a Returns not complete.

^b Returns not available.

The output of the world's shipyards during the calendar year 1916 will exceed that of 1915. During the first ten months of the year 1916, American yards have completed 963 vessels of 431,345 gross tons. During the first nine months of 1916 British yards have launched 246 vessels of 430,522 gross tons, and France has recently launched the passenger ship *Paris*, greater in tonnage than all the merchant shipping she launched in 1915. The steel merchant ships under construction or contract in the United States on October 1, 1916, numbered 417 of 1,454,270 gross tons. On June 30, 1916, the shipyards of the United Kingdom had 440 ships of 1,540,218 tons, nearly all steel steamers, under construction. In the late summer of 1916 Japanese yards had contracts running into 1918 for 104 ships of 464,370 tons. At the close of 1915 Dutch yards had under contract to build within three years 71 ships of 251,750 tons, and on the same date Italian yards were building 12 steamships of 82,500 gross tons.

Conditions Affecting American Maritime Interests.

I have presented the more important facts of the recent growth of American merchant shipping and the recent changes in the merchant shipping of the rest of the world and comparative facts about the recent growth of American shipbuilding and the changes in shipbuilding in other maritime countries.

satisfaction which our progress must afford to Americans. I am more concerned with our maintenance of the position now gained and our improvement of the opportunity afforded by conditions of to-day and of the future just ahead. While the building of merchant ships and the operation of such ships are, of course, wholly distinct, governed by different conditions, natural and artificial, the two have been linked together in the case of successful maritime nations.

One of the first conditions essential to the prosecution of both of these branches of activity, abundant capital, works now more strongly in our favor than before, and as the European war continues our capital increases and foreign capital is consumed. Even after the close of the war the drain on production to raise the taxes to meet the obligations arising from the war will be very heavy. Foreign shipbuilding and the operation of foreign merchant ships must contribute to this taxation and will be handicapped accordingly.

We are equally fortunate in the possession of abundant steel of domestic production, essential as the prime raw material for shipbuilding. We have abundant copper, abundant coal, oil, and lumber. The other leading maritime nations lack one or more of these resources.

Under the spur of demands arising during the war the number of our skilled workers in steel has increased rapidly in the past two years, and one of the ultimate benefits to the country of the large amount of steel shipbuilding for commercial and naval purposes now engaging American shipyards will be the training of a proportionately large number of mechanics and laborers in the diverse branches of labor involved in modern shipbuilding.

The intimate association of a merchant marine under the national flag with all forms of our national life have been brought home to the American people during the past two years. Shipbuilding and shipowning, it has been demonstrated, are on a different and a higher plane than other industries, for in a measure all others are more or less dependent on them, and there is need, accordingly, for a large and intelligent consideration of their welfare. Shipbuilding necessarily is conducted here and abroad under the conditions of the freest international competition. The prospective shipowner of any nation may purchase a ship in any market which offers the most favorable terms and sail it under the colors to which he owes allegiance. This latter opportunity was extended to Americans by the ship-registry act of 1914. Up to

tions concerning the right to land in their seaports, and passports are now generally required from seamen as a condition to landing. The shipping commissioners have been employed as far as practicable in assisting American seamen to secure passports and certificates of citizenship. The dangers from submarines and mines adrift have increased the perils of the sea, and the anxiety of friends and relatives ashore as to the whereabouts of men afloat has increased the correspondence on such subjects, which falls within the line of the shipping commissioner's duty. The statute (sec. 4508, Rev. Stat.) requires the shipping commissioner "to afford facilities for engaging seamen by keeping a register of their names and characters," and the need of such a register has never in recent time been greater than under present abnormal conditions. At most of the offices, however, it has not been practicable to keep up with this work, as the actual work of shipping, paying off, and discharging seamen has taken all the time of the small force authorized by the appropriations. The enactment of the seamen's law of March 4, 1915, especially sections 2, 3, 4, and 7, in so far as they deal with wages and deductions therefrom, has for a time at least increased the occasions for disputes which it is the special function of the shipping commissioner to arbitrate if practicable. The prosecution of commerce by sea depends to a great extent upon the prompt despatch of ships and to secure this despatch the shipping commissioners' offices must be adequately and intelligently manned. The work has grown so rapidly and so unexpectedly that the service at some points is in danger of breaking down unless reasonable provision be made by Congress to strengthen it.

The Department has practically exhausted temporary expedients in appeals to other branches of the Government to perform for it duties imposed by law upon the Department of Commerce.

Although the returns of shipping commissioners cover the repeated shipments and discharges of the same men on various voyages during the year, they give an approximate idea of the nationality of the men who compose the crews of our merchant ships. Out of 252,681 thus shipped last year, 76,956 were reported as American born and 31,877 as naturalized Americans; in all, 108,833, or 43 per cent of the total. This percentage is corroborated by a special inquiry conducted by shipping commissioners into the exact composition of the crews of American steamers shipped by them from May 1 to July 30, 1916. The steamers numbered 433, of 1,520,176 gross tons, and were manned by 21,010 men, of whom 5,807 were in the deck depart- in the

engine department, and 6,790 in the steward's department and miscellaneous. Of the total, 6,692 were American born and 2,486 naturalized Americans, a total of 9,178, or about 45 per cent. From November, 1915, to June 1, 1916, the Steamboat-Inspection Service issued 20,678 certificates to able seamen, of whom 6,302 were American born and 2,165 were naturalized Americans, a total of 8,467, or about 43 per cent, these figures covering men on vessels of the Great Lakes as well as on ocean vessels. As the ships now building in American yards are completed from time to time, there will be an increasing demand for seamen, and there is no reason to believe that it can be met to any greater extent than at present from our native-born population. On the contrary, the great increase in the Navy authorized at the last session of Congress will call for a large increase in the Navy personnel, and all are agreed that our warships should be manned throughout by our own citizens.

Navigation Receipts.

The receipts from tonnage duties during the fiscal year ended June 30, 1916, amounted to \$1,454,565.83 (including \$3,455.40 collected for the Philippine Islands' fund and \$4,623.50 alien and penal tonnage duties). The year's revenue is the largest from this source for any year since the Civil War period and may be compared with \$1,315,425.30 collected during the fiscal year 1915 and \$1,310,759.03 collected during the fiscal year 1914. The receipts last year, accordingly, were 10 per cent greater than during the year before the outbreak of the war. The increase is wholly from ships in the overseas trade with Europe, Asia, Africa, Australia, and South America. Ships from ports in those continents paid \$1,325,699.29, compared with \$1,165,568.75 in 1914, while ships from near-by foreign ports of the Western Hemisphere paid only \$124,243.04, compared with \$143,136.78 in 1914. Changes made by two years of world warfare in the flags of the ships carrying the foreign trade of the United States are shown by the following comparative table of tonnage duties paid by the flag during 1914 and 1916:

Flag.	1914	1916	Increase (+) or decrease (-).
American	\$77,445.06	\$169,785.02	+ \$92,339.96
Other neutrals	147,106.18	315,907.65	+ 168,801.47
Allies	875,737.20	960,793.56	+ 85,056.36
German and Austro-Hungarian	210,470.59	.70	- 210,469.89
Total	1,310,759.03	1,446,486.93	+ 135,727.90

American and other neutral ships have thus more than made good the loss of revenue through the withdrawal of German and Austro-Hungarian ships.

The receipts from navigation fees during the past year were \$158,518.08, compared with \$142,446.37 for the year 1915 and \$152,694.19 for the year ended June 30, 1914. The amount collected for navigation fees, \$158,518.08, and the tonnage dues, \$1,454,565.83, together \$1,613,083.91, are all the Federal taxes imposed on shipping, American and foreign, in ports of the United States. The value of our exports and imports of merchandise during the past fiscal year was \$6,531,542,375, and the Federal charges on shipping, accordingly, were only one-fortieth of 1 per cent of the value of the cargoes carried.

The receipts from navigation fines during the year amounted to \$52,381.75, compared with \$41,518.24 for the previous year, and the current year will probably show a further increase. From the three sources named the revenues for the fiscal year 1916 were \$1,665,465.66, compared with \$1,499,389.91 for the year 1915 and \$1,504,194.60 for the year 1914.

In addition to the annual revenues, the sum of \$15,540 principal and \$4,309.71 interest, in all \$19,849.91, was collected on three foreign-built yachts under the decision of the Supreme Court of the United States in the case of *Billings v. The United States* (232 U. S., 261) and \$220 was collected for deceased passengers under the passenger act of 1882, making the total navigation receipts for the fiscal year \$1,685,535.37. The entire cost of maintaining the Bureau of Navigation was \$187,130.

Radio Communication.

The work of the Bureau of Navigation in enforcing the two acts relating to radio communication and the London International Radio Telegraphic Convention of 1912 has been carried on throughout the year. This work comprises the inspection of stations on ships and on land and the licensing of American stations and the examination and licensing of operators. The inspection of radio apparatus on shipboard before vessels clear is always an important feature of this service, and under present conditions, when submarines and mines adrift have added to the usual perils of the sea, such inspection is the more necessary. To meet these conditions merchant ships in increasing numbers have been equipped with wireless apparatus beyond the requirements of the laws of

the United States or other nations. During the past year the radio apparatus on shipboard has been inspected just before 7,236 clearances, compared with 6,155 such inspections during the previous fiscal year. During the past fiscal year in 76 marine casualties the wireless apparatus and operators on board contributed to the saving of life and property. In the case of 45 American ships and 20 foreign ships, either involved in the disaster or coming to the rescue, the apparatus had been inspected by the Department's officers. The ship-inspection work has been carried on during the year by 12 inspectors and assistant inspectors at the principal seaports of the United States. This force has sufficed to inspect the apparatus on about half the clearances of ships subject to the radio-inspection laws, but this result has been possible only by concentrating efforts at the principal seaports with occasional journeys to less important shipping centers. An increase in the inspection force will be asked for, as it is certain that the use of wireless on shipboard will increase.

The total number of licenses for stations issued during the year was 5,601, compared with 4,039 during the previous year. Licenses hitherto issued have been valid for only one year, owing to the changes in apparatus due to the rapid development of the art. Beginning with the current fiscal year, however, licenses issued for ship stations and amateur stations will be valid for two years. The total number of operators' licenses issued during the year was 5,680, compared with 4,859 for the previous year. There are now, approximately, 3,000 first and second grade licensed commercial operators and 285 cargo-grade operators. The number of licensed amateur operators is, approximately, 7,000, and many of these have recently been organized as a reserve force under naval direction. The number of licenses to operators for experiment and instruction is 57, and extra first commercial-grade licenses have been issued to 36 men of special attainments.

The London International Radio Telegraphic Conference of 1912 resolved to hold the next international conference in 1917, and with the approval of the State Department the chairman of the American delegation invited the conference to meet in Washington. In view of the European war, however, it is plain that the conference can not be held in 1917.

Enforcement of the Navigation Laws.

The following table sets forth in detail, by ports and laws violated, the work of the Department in the enforcement of the navigation laws during the fiscal year 1916 and a comparison with previous years.

VIOLATIONS OF NAVIGATION LAWS REPORTED BY THE VARIOUS COLLECTORS OF CUSTOMS, SHOWING THE LAWS VIOLATED, FISCAL YEAR ENDED JUNE 30, 1916, COMPARED WITH PREVIOUS YEARS.

Customs district. ^a	Total.	Steamboat laws (4397-4500, R. S.).	Motor-boat law, "Rules of road," (4325-4326, R. S.).	Surrendered license (4325-4326, R. S.).	Bills of health (Feb. 15, 1891), ^b	Seamen's act (Mar. 4, 1915).	Anchorage and St. Marys River rules.	Passenger act (Aug. 2, 1882).	Enrollment and li- cense (4336, R. S.).	Entry and clearance (4374, 4397, R. S.).	Name on vessel (4176, R. S.).	Change of master (4335, R. S.).	Unloading.	Radio communica- tion laws.	Miscellaneous.
Baltimore.....	312	22	210	34	....	16	....	1	....	27	1	....	1	....	1
Boston.....	418	122	213	46	....	6	....	4	1	1	3	....	2	11	3
Bridgeport.....	54	3	30	19	....	....	....	1	1	....	1	....	....	....	....
Buffalo.....	144	15	63	1	....	59	....	....	1	5	....	....	....	....	....
Charleston.....	39	6	12	11	....	....	....	....	....	7	2	1	....	....	....
Chicago.....	389	21	344	5	....	6	....	1	....	8	1	....	2	1	1
Cleveland.....	212	22	82	27	....	16	....	....	3	2	....	....	....	....	....
Des Moines.....	4	....	4	....	....	....	....	....	....	....	....	....	....	....	....
Detroit.....	441	32	346	33	....	1	1	....	....	4	2	2	13	1	4
Duluth.....	79	35	36	5	....	1	....	....	1	....	1	....	....	....	....
Galveston.....	50	22	1	12	11	....	....	1	....	....	....	....	1	1	1
Honolulu.....	12	7	....	2	....	....	....	1	....	2	....	....	3	1	2
Indianapolis.....	109	2	107	....	....	....	....	....	....	....	....	....	....	....	....
Jamez.....	33	3	2	24	....	....	....	2	1	....	....	....	1	....	....
Laredo.....	7	1	1	3	....	....	....	....	....	....	....	....	....	....	....
Los Angeles.....	172	5	138	9	....	1	....	....	1	1	3	....	10	....	2
Louisville.....	63	4	41	9	....	....	....	....	....	....	....	....	8	....	1
Memphis.....	94	6	64	12	....	....	....	....	....	3	....	....	2	....	1
Milwaukee.....	133	8	112	....	....	....	....	1	....	5	1	....	....	....	....
Mobile.....	106	15	5	33	26	....	1	....	....	23	....	....	1	....	2
New Orleans.....	177	43	26	84	....	....	....	3	....	9	....	....	5	....	7
New York.....	1,256	128	983	50	....	4	....	3	23	6	62	2	2	1	1
Norfolk.....	531	40	399	42	....	1	....	4	....	34	1	3	1	6	6
Ogdensburg.....	92	2	27	46	....	....	....	....	14	....	....	....	....	....	3
Philadelphia.....	483	13	342	77	....	10	....	4	....	21	5	1	....	....	....
Pittsburgh.....	27	10	13	4	....	....	....	....	....	....	....	....	....	....	....
Port Arthur.....	62	15	11	8	....	3	....	3	....	....	1	2	....	5	5
Portland, Me.....	241	14	123	38	....	1	....	....	....	4	....	....	1	....	....
Portland, Oreg.....	229	....	208	3	....	....	....	2	....	7	1	....	1	....	7
Providence.....	125	4	22	24	....	....	....	2	1	2	1	3	....	....	....
Rochester.....	42	2	40	....	....	....	....	....	....	....	....	....	....	....	....
St. Albans.....	33	....	33	....	....	....	....	....	....	....	....	....	....	....	....
St. Louis.....	154	3	125	21	....	....	....	....	....	....	....	....	....	....	....
St. Paul.....	5	....	5	....	....	....	....	....	....	....	....	....	....	....	....
San Francisco.....	276	45	122	26	....	20	....	4	2	1	19	4	9	5	13
San Juan.....	11	3	4	4	....	....	....	....	....	....	....	....	....	....	....
Savannah.....	22	1	60	15	....	3	....	....	....	....	....	1	1	....	1

^a No violations reported at ports not named.

^b Bills-of-health cases transferred to Treasury De-

VIOLATIONS OF NAVIGATION LAWS REPORTED BY THE VARIOUS COLLECTORS OF CUSTOMS, SHOWING THE LAWS VIOLATED, FISCAL YEAR ENDED JUNE 30, 1916, COMPARED WITH PREVIOUS YEARS—Continued.

Customs district.	Total.	Steamboat laws (4399-4500, R. S.).	Motor-boat laws, "Rules of road."	Surrendered license (4325-4326, R. S.).	Bills of health (Feb. 15, 1893).	Seamen's act (Mar. 4, 1915).	Anchorage and St. Marys River rules.	Passenger act (Aug. 2, 1882).	Enrollment and li- cense (4316, R. S.).	Entry and clearance (2774, 4197, R. S.).	Name on vessel (4178, R. S.).	Change of master (4335, R. S.).	Unloading.	Radio communica- tion laws.	Miscellaneous.
Seattle.....	409	10	196	125	...	37	...	2	4	2	24	3	3	...	3
Tampa.....	570	25	342	80	...	49	...	...	...	2	34	5	5	2	26
Wilmington, N. C.....	137	7	95	5	...	...	...	...	2	...	28	...	...	...	...
Total—															
1916 (48 ports) ^a	7,825	812	5,126	943	...	271	1	19	59	28	331	35	67	43	90
1915 (48 ports) ^a	6,868	671	4,462	982	...	...	11	10	104	41	348	67	93	37	42
1914 (49 ports) ^a	6,720	768	4,838	631	...	...	8	25	41	26	153	59	90	36	45
1913 (107 ports).....	3,506	333	2,783	23	...	...	23	8	24	10	83	26	1	40	152
1912 (105 ports).....	3,634	165	3,119	96	3	...	12	17	38	39	81	12	...	...	52
1911 (92 ports).....	2,268	182	1,811	23	41	...	17	45	10	16	43	30	...	...	50
1910 (74 ports).....	1,070	252	488	17	52	...	13	61	13	16	68	12	2	...	76
1909 (64 ports).....	1,134	151	710	33	69	...	3	21	14	7	59	...	4	...	63
1908 (73 ports).....	852	245	385	12	42	...	6	21	23	18	30	7	2	...	61
1907 (66 ports).....	684	209	92	88	36	...	18	62	9	23	52	27	5	...	63
1906 (77 ports).....	670	194	130	114	41	...	13	27	10	6	49	5	9	...	72
1905 (63 ports).....	524	142	53	99	42	...	13	21	26	7	20	11	28	...	62
1904 (66 ports).....	706	184	93	101	48	...	49	16	29	12	24	19	(b)	...	131

^a Reports are now made by subports through the principal port of the district.

^b Included under "Miscellaneous" in 1904 report.

Since the Department in 1912 and 1913 began the enforcement of the navigation laws through the operation of its own vessels careful study has been made of the various methods employed to enforce the navigation laws. It has now been clearly demonstrated that in the case of all laws affecting vessels while under way it is necessary that our inspecting officers should have a vessel from which such inspections can be made. When the vessels are in their docks or at anchor it is not safe to leave the equipment on board and available for inspection, as it is liable to be stolen, and it is impossible to tell whether the ship was manned with the crew required by law. The *Tarragon* and the *Dixie* during the year reported 1,971 violations of law. The Coast Guard aided by reporting 1,333 such violations. A great many of the cases reported by the customs officers were discovered through the use of motor boats, allotments for the hire of which were made by this Department. Practically all of the 1,089 cases reported by navigation inspectors were discovered with the use of such vessels. The inspecting officers should be

men thoroughly familiar with the laws they are enforcing, tactful, and with good judgment, and willing to continue their work at all hours of the day or night. Many of the most flagrant violations are discovered after sunset and on Sundays and holidays. The service is a difficult one. It is meeting with the approval of ship publications, associations, and clubs. The assistance of the United States power squadrons and similar organizations is, together with the Department's inspection work, resulting in a material improvement in the equipment and navigation of all classes of vessels.

Last year the Department asked for an appropriation for the purchase of a vessel to be operated on the Mississippi River, where at present there is no Federal patrol in the enforcing of the navigation laws. The reasons for the use of the vessel on these waters were set forth in detail in my report for 1915. Request for this appropriation will be renewed this year.

The following table shows the work of the various agencies of the Government employed in the enforcement of the navigation laws.

VIOLATIONS OF NAVIGATION LAWS, SHOWING THE WORK DONE BY THE COAST GUARD, THE MOTOR VESSEL "TARRAGON," THE MOTOR VESSEL "DIXIE," LOCAL INSPECTORS OF STEAM VESSELS, RADIO INSPECTORS, CUSTOMS OFFICERS, AND NAVIGATION INSPECTORS, FISCAL YEAR ENDED JUNE 30, 1916.

[The work of the customs officers under allotments made by the Department is shown in the last column.]

Customs district. *	Total.	Coast Guard.	Tarragon.	Dixie.	Local inspectors.	Radio inspectors.	Customs officers.	Navigation inspectors.	Cases reported under allotments.
Baltimore.	325	5	15	96	5	.....	62	142	.....
Boston.	407	46	17	116	119	10	99	.....	.....
Bridgeport.	58	.....	19	13	4	.....	22	.....	.....
Buffalo.	141	5	.....	5	72	.....	6	53	.....
Charleston.	41	11	11	.....	.....	.....	19	.....	.....
Chicago.	383	285	.....	.....	5	1	10	82	285
Cleveland.	208	8	.....	.....	81	.....	83	36	.....
Des Moines.	4	2	.....	.....	.....	.....	2	.....	.....
Detroit.	454	256	.....	.....	43	1	61	93	.....
Duluth.	79	2	.....	.....	12	.....	53	12	.....
Galveston.	54	5	.....	.....	.....	.....	49	.....	.....
Honolulu.	14	.....	.....	.....	.....	.....	14	.....	.....
Indianapolis.	109	.....	.....	.....	2	.....	18	89	.....
Juneau.	31	.....	.....	.....	1	.....	30	.....	.....
Laredo.	6	.....	.....	.....	.....	.....	6	.....	.....
Los Angeles.	173	2	.....	.....	.....	10	161	.....	127
Louisville.	69	.....	.....	.....	6	.....	27	36	41
Memphis.	89	.....	.....	.....	9	.....	28	52	50

* No violations reported at ports not named.

VIOLATIONS OF NAVIGATION LAWS, SHOWING THE WORK DONE BY THE COAST GUARD, THE MOTOR VESSEL "TARRAGON," THE MOTOR VESSEL "DIXIE," LOCAL INSPECTORS OF STEAM VESSELS, RADIO INSPECTORS, CUSTOMS OFFICERS, AND NAVIGATION INSPECTORS, FISCAL YEAR ENDED JUNE 30, 1916.

Customs district.	Total.	Coast Guard.	Tarragon.	Dixie.	Local inspectors.	Radio inspectors.	Customs officers.	Navigation inspectors.	Cases reported under allotments.
Milwaukee.....	122	116					6		
Mobile.....	104	6			12		86		
New Orleans.....	170	20			13	2	135		
New York.....	1,252	25	435	305	79	2	308	98	
Norfolk.....	578	7	125	250	50		67	79	
Ogdensburg.....	95				2		93		28
Philadelphia.....	489		29	9	17		131	303	
Pittsburgh.....	24			4	8		5	7	
Port Arthur.....	65	9			6		50		
Portland, Me.....	238	8		170	10	1	42	7	
Portland, Oreg.....	231						231		217
Providence.....	123	60		11	5		47		
Rochester.....	42				2		40		38
St. Albans.....	32						32		32
St. Louis.....	155	15			4		136		107
St. Paul.....	5						5		
San Francisco.....	293	175			1	5	112		173
San Juan.....	15						15		
Savannah.....	84	15	4		1		64		
Seattle.....	420	151			2		267		76
Tampa.....	574	68	232	5	15	4	250		
Wilmington, N. C.....	139	31	100		4		4		
Total (48 ports).....	7,895	1,333	987	984	590	36	2,876	1,089	1,178

The foregoing statement of the work done by the various inspection services is based on reports made by collectors of customs on Cat. 1078 and is approximately correct. At Chicago and San Francisco, however, allotments made by the Department were used by Coast Guard officers, and that Service, as well as the allotment, has been credited with the results. The statement of cases reported under the Department allotments necessarily is approximate only.

There are two facts respecting the Navigation Service which should cause satisfaction to the public. The first is that the Service, though expanding rapidly by reason of the numerous demands upon it as already explained, is still operated at a cost of one-ninth of the revenues which are derived under its supervision. The second is that the strictly educational work of enforcing the navigation laws is itself also fully self-sustaining. It not only pays

its own way, but it pays for the boats and apparatus with which the work is done. The following table shows over a period of five years the outlay for this work, including the cost of vessels and their maintenance and the receipts derived from the mitigated fines:

	Original cost.	Maintenance.					Total.
		1912	1913	1914	1915	1916	
Tarragon.....	\$84,500.00	\$1,316.62	\$9,022.77	\$11,335.76	\$7,597.13	\$5,113.26	\$38,885.54
Dixie.....	69,000.00				1,780.84	16,915.94	17,696.78
Total.....	13,500.00	1,316.62	9,022.77	11,335.76	9,377.97	22,029.20	66,582.32
Collections from navigation fines.....		31,578.13	31,987.85	47,162.02	41,518.24	52,381.75	204,627.99

^a April, 1912.

^b April, 1915.

More important than these satisfactory financial results, however, is the fact of the widespread cooperation of vessel owners and officers in complying with the requirements of the law. The existing conditions in this respect have radically changed for the better within the last three years. It is unfortunate that the operations of the Service have been limited to the Atlantic coast and the waters directly connected therewith. Nothing has been practicable for lack of funds on the Gulf, in the Mississippi Valley, on the Great Lakes, or on the Pacific coast. The power-boat associations in these waters desire the service extended to them. It is as urgently needed there as experience has shown it was required on the Atlantic shores. It can be conducted there without cost to the Government, as it has been conducted elsewhere. It is earnestly hoped that Congress will at the next session provide another small motor vessel for the development of this important service on the waters of the Gulf, the Mississippi Valley, and the Great Lakes.

Navigation Inspectors.

The work of preventing the overcrowding of passenger vessels has proceeded during the fiscal year 1916 with increasing efficiency.

The following table shows the work done by customs districts.

NUMBER OF COUNTS, AND THE NUMBER OF PASSENGERS INVOLVED, IN PREVENTING
OVERCROWDING OF PASSENGER VESSELS DURING THE FISCAL YEAR ENDED JUNE
30, 1916.

Customs district.	Navigation Service.		Customs Service.		Total.	
	Counts.	Passen- gers.	Counts.	Passen- gers.	Counts.	Passen- gers.
Baltimore, Md.....	1,432	710,947	6	4,656	1,438	715,603
Boston, Mass.....	82	18,779	950	627,986	1,032	646,765
Bridgeport, Conn.....			26	15,791	26	15,791
Buffalo, N. Y.....	1,311	490,216	2,966	580,295	4,277	1,070,511
Charleston, S. C.....			17	5,597	17	5,597
Chicago, Ill.....	814	211,939	88	27,756	902	239,695
Cleveland, Ohio.....	367	145,655	288	184,765	655	330,420
Des Moines, Iowa.....			3	1,584	3	1,584
Detroit, Mich.....	906	784,647	104	138,430	1,010	923,077
Duluth, Minn.....	149	29,522	52	12,035	201	41,557
Galveston, Tex.....			83	4,729	83	4,729
Indianapolis, Ind.....	108	38,546	14	10,059	122	48,605
Los Angeles, Cal.....			21	9,003	21	9,003
Louisville, Ky.....	52	6,541	231	85,911	283	92,452
Memphis, Tenn.....	178	57,874	58	17,680	236	75,554
Mobile, Ala.....			102	22,096	102	22,096
New York, N. Y.....	184	64,785	28	6,313	212	71,098
Norfolk, Va.....	121	28,107	120	29,324	241	57,431
Ogdensburg, N. Y.....			18	6,329	18	6,329
Philadelphia, Pa.....	331	151,731	16	6,819	347	158,550
Port Arthur, Tex.....			16	64	16	64
Portland, Me.....	1,580	212,272	35	6,355	1,615	218,627
Portland, Oreg.....			44	11,317	44	11,317
Providence, R. I.....	744	293,392	1	500	745	293,892
Rochester, N. Y.....			4	3,030	4	3,030
St. Albans, Vt.....			55	14,214	55	14,214
Seattle, Wash.....			83	32,633	83	32,633
Tampa, Fla.....			22	4,127	22	4,127
Total.....	8,359	3,244,953	5,451	1,867,814	13,810	5,114,351
Total for fiscal year 1915.....	5,061	1,439,273	5,586	1,619,445	10,647	3,058,718

The Department aims to prevent accidents and violations rather than to permit violations of law at the risk of accident and then to inflict penalties.

The table following shows the cases (called shut-offs) in which inspectors have been obliged to stop vessels from loading to excess above the legal limit, arranged by months and customs districts.

SHUT-OFFS BY MONTHS DURING THE FISCAL YEAR ENDED JUNE 30, 1916.

Customs district.	July.		August.		September.		November.		December.	
	Counts.	Passen- gers.	Counts.	Passen- gers.	Counts.	Passen- gers.	Counts.	Passen- gers.	Counts.	Passen- gers.
Baltimore.....	8	7,075	2	2,300	1	500				
Boston.....	12	11,765	4	5,300	2	525				
Buffalo.....	3	1,092	3	1,582						
Chicago.....	10	4,755								
Cleveland.....	7	11,800	10	13,800	2	1,400				
Detroit.....	13	28,268	1	3,166						
Duluth.....			1	484	1	484				
Indianapolis.....	1	900								
Los Angeles.....	1	60								
Louisville.....	1	1,000								
Mobile.....	1	550								
New York.....	2	2,200								
Norfolk.....	1	600	5	2,225						
Portland, Me.....	1	475			1	550	1	254		
Portland, Oreg.....	3	1,249	1	370						
Providence.....	2	1,000	7	5,940	4	2,906				
Seattle.....	5	2,070	9	2,415						
Tampa.....			1	300					1	238
Total.....	71	74,859	44	38,082	11	6,365	1	254	1	238

Customs district.	January.		April.		May.		June.		Total.	
	Counts.	Passen- gers.	Counts.	Passen- gers.	Counts.	Passen- gers.	Counts.	Passen- gers.	Counts.	Passen- gers.
Baltimore.....					3	3,582			14	13,657
Boston.....							2	294	20	17,884
Buffalo.....									6	2,674
Charleston.....			1	300	2	1,000	1	500	4	1,800
Chicago.....							4	812	14	5,567
Cleveland.....							5	3,405	24	30,405
Detroit.....					3	9,693	9	25,464	26	66,591
Duluth.....									2	968
Indianapolis.....									1	900
Los Angeles.....									1	60
Louisville.....									1	1,000
Memphis.....					1	492	1	600	2	1,092
Mobile.....					1	42	1	42	3	634
New York.....									2	2,200
Norfolk.....			1	234			2	592	9	3,651
Portland, Me.....									3	1,279
Portland, Oreg.....									4	1,619
Providence.....									13	9,846
Rochester.....					1	600			1	600
Seattle.....									14	4,485
Tampa.....	1	228							3	766
Total.....	1	228	2	534	11	15,409	25	31,709	167	167,678

NOTE.—Total for fiscal year ended June 30, 1915, 92 counts, 95,293 passengers.

In addition to counting these passengers the navigation inspectors during their spare time enforce so far as practicable the laws in regard to the equipment and manning of all classes of vessels. During the fiscal year 1916 they discovered 1,089 violations of law, an increase of 90 cases over the work of 1915.

The Department is training these men as rapidly as possible in order that it may have at the principal ports a force familiar with the laws they are enforcing and the manner in which the work should be done. In order to secure the best results, vessel owners must be satisfied that the purposes of the Department are educational rather than punitive.

Repaired Wrecks.

Under the act of February 24, 1915, the following foreign-built vessels wrecked and repaired in American shipyards have been admitted to American enrollment for the coasting trade: Norwegian steamer *Anita*, 1,186 gross tons, wrecked off Turks Island, repaired at a cost of \$64,000, and documented as the steamship *Elizabeth Weems*; Italian bark *Rosalia d'Ali*, 1,432 gross tons, wrecked in Hampton Roads, repaired at a cost of \$15,000, and documented as the barge *Coastwise*; Russian bark *Hilja*, 707 gross tons, wrecked at Pascagoula, Miss., repaired at a cost of \$11,000, and documented as the barge *Choctaw*; British steamship *Dunholme*, 3,675 gross tons, wrecked at Bayonne, N. J., repaired at a cost of \$220,000, and documented as the steamship *Campana*; and the British ship *Ben Cruachan*, wrecked on the Mexican coast, repaired at a cost of \$10,000, and authorized to be documented as the gasoline schooner *Carmela*.

Passenger Act of 1882.

During the year ended June 30, 1916, passenger steamers subject to the act of 1882 on 720 voyages brought 154,057 steerage passengers to ports of the United States, compared with 211,509 such passengers carried on 956 voyages during the fiscal year ended June 30, 1915. That fiscal year, however, included the month of July, 1914, before the European war broke out and the month of August, when many Americans hastened to return home in the steerage, those two months contributing 322 voyages and 110,021 steerage passengers to the returns for that year. Excluding these two months from each fiscal year, 133,503 steerage passengers were brought to the United States on 583 voyages during the past year, compared with 101,488 passengers on 634 voyages during the fiscal year 1915. In the year ended June 30, 1914, on 1,797 voyages

1,016,453 steerage passengers were brought to our ports. The act of 1882 has been enforced carefully during the year as to incoming and outgoing steamers.

Seamen's Act of 1915.

The seamen's act of March 4, 1915, took effect as to vessels of the United States on November 4, 1915, and as to foreign vessels on March 4, 1916, except as to such parts of the act as are in conflict with articles of any treaty or convention. Such parts of the act as regards the vessels of such foreign nations took effect on July 1, 1916. Parts of the act, accordingly, were in effect during eight months of the past fiscal year, and no part of it applicable to both American and foreign ships was in force for more than four months of the year, while some parts of the act relating to foreign ships did not begin to take effect until after the close of the fiscal year on June 30, 1916. It is clearly impracticable to give a final judgment on the general results of so sweeping a measure which has been in force for so short a time and has been applied under its terms so irregularly to the ships of different nations. As was to be expected in the case of a measure quite new in principle and in the application of its requirements to the shipping laws of the United States or other nations, there were many violations of the act by American ships in the few months of its operation, and these, in view of the considerations named, the Department has generally treated leniently, so that commerce should not be impeded through the lack of familiarity with the many provisions of this new law. It has been necessary to obtain from the Department's Solicitor a construction of many of the phrases of the act and in several matters to obtain the opinion of the Attorney General.

The shipping business has, however, adjusted itself with remarkable facility to the operation of the law. In minor points, as in the number of life buoys to be carried on small steamers, the law has required or will require amendment. The Department, however, believes that it marks a great step forward in dealing with transportation by shipping on a more humane and effective basis than heretofore. It is my own conviction that those who have in the past opposed this measure will in the future come to consider it as one of the greatest safeguards for our merchant marine. That marine can never permanently prosper unless the men upon whose services it depends share in its prosperity—not merely in accommodations and in food, but in earning power as well.

CONCLUSION.

The foregoing is respectfully commended to your attention and to that of Congress.

Respectfully,

WILLIAM C. REDFIELD,
Secretary.

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